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<b>(54) Title:</b> HUMAN PROTEINS HAVING HYDROPHOBIC DOMAINS AND DNAS ENCODING THESE PROTEINS  <b>(57) Abstract</b>  The present invention provides human proteins having hydrophobic domains, DNAs encoding these proteins, and expression vectors for these DNAs as well as eukaryotic cells expressing these DNAs.		

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## DESCRIPTION

Human Proteins Having Hydrophobic  
Domains and DNAs Encoding These Proteins

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TECHNICAL FIELD

The present invention relates to human proteins having hydrophobic domains, DNAs encoding these proteins, and expression vectors for these DNAs as well as eukaryotic cells expressing these DNAs. The proteins of the present invention can be employed as pharmaceuticals or as antigens for preparing antibodies against these proteins. The human cDNAs of the present invention can be utilized as probes for genetic diagnosis and gene sources for gene therapy. Furthermore, the cDNAs can be utilized as gene sources for large-scale production of the proteins encoded by these cDNAs. Cells into which these genes are introduced to express secretory proteins or membrane proteins in large quantity can be utilized for detection of the corresponding receptors or ligands, screening of novel small molecule pharmaceuticals and the like.

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BACKGROUND ART

Cells secrete many proteins extracellularly. These secretory proteins play important roles in the proliferation control, the differentiation induction, the material transport, the biophylaxis, and the like of the cells. Unlike intracellular proteins, the secretory proteins exert their actions outside the cells. Therefore, they can be administered in the intracorporeal manner such as the injection or the drip, so that they possess hidden

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potentialities as pharmaceuticals. In fact, a number of human secretory proteins such as interferons, interleukins, erythropoietin, thrombolytic agents and the like have been currently employed as pharmaceuticals. In addition, 5 secretory proteins other than those described above are undergoing clinical trials for developing their use as pharmaceuticals. It is believed that the human cells produce many unknown secretory proteins. Availability of these secretory proteins as well as genes encoding them is 10 expected to lead to development of novel pharmaceuticals utilizing these proteins.

On the other hand, membrane proteins play important roles, as signal receptors, ion channels, transporters and the like in the material transport and the signal 15 transduction through the cell membrane. Examples thereof include receptors for various cytokines, ion channels for the sodium ion, the potassium ion, the chloride ion and the like, transporters for saccharides and amino acids and the like. The genes for many of them have already been cloned. 20 It has been clarified that abnormalities of these membrane proteins are involved in a number of previously cryptogenic diseases. Therefore, discovery of a new membrane protein is expected to lead to elucidation of the causes of many diseases, so that isolation of new genes encoding the 25 membrane proteins has been desired.

Heretofore, due to difficulty in the purification from human cells, many of these secretory proteins and membrane proteins have been isolated by genetic approaches. A general method is the so-called expression cloning method, in which 30 a cDNA library is introduced into eukaryotic cells to express cDNAs, and the cells secreting, or expressing on the surface of membrane, the protein having the activity of



interest are then screened. However, only genes for proteins with known functions can be cloned by using this method.

In general, a secretory protein or a membrane protein possesses at least one hydrophobic domain within the protein.  
5 After synthesis in the ribosome, such domain works as a secretory signal or remains in the phospholipid membrane to be entrapped in the membrane. Accordingly, if the existence of a highly hydrophobic domain is observed in the amino acid sequence of a protein encoded by a cDNA when the whole base  
10 sequence of the full-length cDNA is determined, it is considered that the cDNA encodes a secretory protein or a membrane protein.

#### OBJECTS OF THE INVENTION

15 The main object of the present invention is to provide novel human proteins having hydrophobic domains, DNAs encoding these proteins, and expression vectors for these DNAs as well as transformed eukaryotic cells that are capable of expressing these DNAs. This object as well as  
20 other objects and advantages of the present invention will become apparent to those skilled in the art from the following description with reference to the accompanying drawings.

#### BRIEF DESCRIPTION OF DRAWINGS

25 Fig. 1 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP02539.

Fig. 2 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP02770.

30 Fig. 3 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP02869.

Fig. 4 illustrates the hydrophobicity/hydrophilicity

profile of the protein encoded by clone HP02956.

Fig. 5 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP02962.

Fig. 6 illustrates the hydrophobicity/hydrophilicity  
5 profile of the protein encoded by clone HP03014.

Fig. 7 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10608.

Fig. 8 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10609.

10 Fig. 9 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10611.

Fig. 10 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10617.

Fig. 11 illustrates the hydrophobicity/hydrophilicity  
15 profile of the protein encoded by clone HP02837.

Fig. 12 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP02991.

Fig. 13 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP03063.

20 Fig. 14 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP03091.

Fig. 15 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP03092.

Fig. 16 illustrates the hydrophobicity/hydrophilicity  
25 profile of the protein encoded by clone HP03116.

Fig. 17 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10618.

Fig. 18 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10619.

30 Fig. 19 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10622.

Fig. 20 illustrates the hydrophobicity/hydrophilicity

profile of the protein encoded by clone HP10625.

Fig. 21 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP02883.

Fig. 22 illustrates the hydrophobicity/hydrophilicity  
5 profile of the protein encoded by clone HP03140.

Fig. 23 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10628.

Fig. 24 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10629.

10 Fig. 25 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10635.

Fig. 26 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10636.

Fig. 27 illustrates the hydrophobicity/hydrophilicity  
15 profile of the protein encoded by clone HP10640.

Fig. 28 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10644.

Fig. 29 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10656.

20 Fig. 30 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10672.

Fig. 31 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP03194.

Fig. 32 illustrates the hydrophobicity/hydrophilicity  
25 profile of the protein encoded by clone HP03219.

Fig. 33 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP03236.

Fig. 34 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP03237.

30 Fig. 35 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP03267.

Fig. 36 illustrates the hydrophobicity/hydrophilicity

profile of the protein encoded by clone HP03270.

Fig. 37 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP03298.

Fig. 38 illustrates the hydrophobicity/hydrophilicity  
5 profile of the protein encoded by clone HP10631.

Fig. 39 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10658.

Fig. 40 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10663.

10 Fig. 41 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP03165.

Fig. 42 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP03266.

Fig. 43 illustrates the hydrophobicity/hydrophilicity  
15 profile of the protein encoded by clone HP03287.

Fig. 44 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10665.

Fig. 45 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10669.

20 Fig. 46 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10670.

Fig. 47 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10671.

Fig. 48 illustrates the hydrophobicity/hydrophilicity  
25 profile of the protein encoded by clone HP10673.

Fig. 49 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10675.

Fig. 50 illustrates the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10683.

#### SUMMARY OF THE INVENTION

As the result of intensive studies, the present inventors have successfully cloned cDNAs encoding proteins having hydrophobic domains from the human full-length cDNA bank, thereby completing the present invention. Thus, the present invention provides a human protein having hydrophobic domain(s), namely a protein comprising any one of an amino acid sequence selected from the group consisting of SEQ ID NOS: 1 to 10, 31 to 40, 61 to 70, 91 to 100, and 121 to 130. Moreover, the present invention provides a DNA encoding the above-mentioned protein, exemplified by a cDNA comprising any one of a base sequence selected from the group consisting of SEQ ID NOS: 11 to 30, 41 to 60, 71 to 90, 101 to 120 and 131 to 150 as well as an expression vector that is capable of expressing such DNA by in vitro translation or in eukaryotic cells and a transformed eukaryotic cell that is capable of expressing such DNA and of producing the above-mentioned protein.

#### DETAILED DESCRIPTION OF THE INVENTION

The proteins of the present invention can be obtained, for example, by a method for isolating proteins from human organs, cell lines or the like, a method for preparing peptides by the chemical synthesis based on the amino acid sequence of the present invention, or a method for producing proteins by the recombinant DNA technology using the DNAs encoding the hydrophobic domains of the present invention. Among these, the method for producing proteins by the recombinant DNA technology is preferably employed. For example, the proteins can be expressed in vitro by preparing an RNA by in vitro transcription from a vector having the

cdNA of the present invention, and then carrying out in vitro translation using this RNA as a template. Alternatively, introduction of the translated region into a suitable expression vector by the method known in the art may lead to expression of a large amount of the encoded protein in prokaryotic cells such as *Escherichia coli*, *Bacillus subtilis*, etc., and eukaryotic cells such as yeasts, insect cells, mammalian cells, etc.

In the case where the protein of the present invention is produced by expressing the DNA by in vitro translation, the protein of the present invention can be produced in vitro by introducing the translated region of this cdNA into a vector having an RNA polymerase promoter, and then adding the vector to an in vitro translation system such as a rabbit reticulocyte lysate or a wheat germ extract, which contains an RNA polymerase corresponding to the promoter. The RNA polymerase promoters are exemplified by T7, T3, SP6 and the like. The vectors containing these RNA polymerase promoters are exemplified by pKA1, pCDM8, pT3/T7 18, pT7/3 19, pBluescript II and the like. Furthermore, the protein of the present invention can be expressed in the secreted form or the form incorporated in the microsome membrane when a canine pancreas microsome or the like is added to the reaction system.

In the case where the protein of the present invention is produced by expressing the DNA in a microorganism such as *Escherichia coli* etc., a recombinant expression vector in which the translated region of the cdNA of the present invention is introduced into an expression vector having an origin which is capable of replicating in the microorganism, a promoter, a ribosome-binding site, a cdNA-cloning site, a terminator and the like is constructed. After transformation

of the host cells with this expression vector, the resulting transformant is grown, whereby the protein encoded by the cDNA can be produced in large quantity in the microorganism. In this case, a protein fragment containing any translated region can be obtained by adding an initiation codon and a termination codon in front of and behind the selected translated region to express the protein. Alternatively, the protein can be expressed as a fusion protein with another protein. Only the portion of the protein encoded by the cDNA can be obtained by cleaving this fusion protein with a suitable protease. The expression vectors for *Escherichia coli* are exemplified by the pUC series, pBluescript II, the pET expression system, the pGEX expression system and the like.

In the case where the protein of the present invention is produced by expressing the DNA in eukaryotic cells, the protein of the present invention can be produced as a secretory protein, or as a membrane protein on the cell-membrane surface, by introducing the translated region of the cDNA into an expression vector for eukaryotic cells that has a promoter, a splicing region, a poly(A) addition site and the like, and then introducing the vector into the eukaryotic cells. The expression vectors are exemplified by pKA1, pED6dpc2, pCDM8, pSVK3, pMSG, pSVL, pBK-CMV, pBK-RSV, EBV vectors, pRS, pYES2 and the like. Examples of eukaryotic cells to be used in general include mammalian cultured cells such as monkey kidney COS7 cells, Chinese hamster ovary CHO cells and the like, budding yeasts, fission yeasts, silkworm cells, *Xenopus* oocytes and the like. Any eukaryotic cells may be used as long as they are capable of expressing the proteins of the present invention. The expression vector can be introduced into the eukaryotic cells by using a method

known in the art such as the electroporation method, the calcium phosphate method, the liposome method, the DEAE-dextran method and the like.

After the protein of the present invention is expressed  
5 in prokaryotic cells or eukaryotic cells, the protein of interest can be isolated from the culture and purified by a combination of separation procedures known in the art. Examples of the separation procedures include treatment with a denaturing agent such as urea or a detergent, sonication,  
10 enzymatic digestion, salting-out or solvent precipitation, dialysis, centrifugation, ultrafiltration, gel filtration, SDS-PAGE, isoelectric focusing, ion-exchange chromatography, hydrophobic chromatography, affinity chromatography, reverse phase chromatography and the like.

15 The proteins of the present invention also include peptide fragments (of 5 amino acid residues or more) containing any partial amino acid sequences in the amino acid sequences represented by SEQ ID NOS: 1 to 10, 31 to 40, 61 to 70, 91 to 100, and 121 to 130. These peptide fragments  
20 can be utilized as antigens for preparation of antibodies. Among the proteins of the present invention, those having the signal sequences are secreted in the form of mature proteins after the signal sequences are removed. Therefore, these mature proteins shall come within the scope of the  
25 protein of the present invention. The N-terminal amino acid sequences of the mature proteins can be easily determined by using the method for the determination of cleavage site of a signal sequence [JP 8-187100 A]. Furthermore, some membrane proteins undergo the processing on the cell surface to be  
30 converted to the secreted forms. Such proteins or peptides in the secreted forms shall also come within the scope of the protein of the present invention. In the case where



sugar chain-binding sites are present in the amino acid sequences of the proteins, expression of the proteins in appropriate eukaryotic cells affords the proteins to which sugar chains are attached. Accordingly, such proteins or peptides to which sugar chains are attached shall also come within the scope of the protein of the present invention.

The DNAs of the present invention include all the DNAs encoding the above-mentioned proteins. These DNAs can be obtained by using a method for chemical synthesis, a method for cDNA cloning and the like.

The cDNAs of the present invention can be cloned, for example, from cDNA libraries derived from the human cells. The cDNAs are synthesized by using poly(A)<sup>+</sup> RNAs extracted from human cells as templates. The human cells may be cells delivered from the human body, for example, by the operation or may be the cultured cells. The cDNAs can be synthesized by using any method such as the Okayama-Berg method [Okayama, H. and Berg, P., Mol. Cell. Biol. 2: 161-170 (1982)], the Gubler-Hoffman method [Gubler, U. and Hoffman, J., Gene 25: 263-269 (1983)] and the like. However, it is desirable to use the capping method [Kato, S. et al., Gene 150: 243-250 (1994)], as exemplified in Examples, in order to obtain a full-length clone in an effective manner. In addition, commercially available human cDNA libraries can be utilized.

The cDNAs of the present invention can be cloned from the cDNA libraries by synthesizing an oligonucleotide on the basis of base sequences of any portion in the cDNA of the present invention and screening the cDNA libraries using this oligonucleotide as a probe for colony or plaque hybridization according to a method known in the art. In addition, the cDNA fragments of the present invention can be prepared from an mRNA isolated from human cells by the RT-

PCR method in which oligonucleotides which hybridize with both termini of the cDNA fragment of interest are synthesized, which are then used as the primers.

5 The cDNAs of the present invention are characterized in that they comprise any one of the base sequences represented by SEQ ID NOS: 11 to 20, 41 to 50, 71 to 80, 101 to 110, and 131 to 140 or the base sequences represented by SEQ ID NOS: 21 to 30, 51 to 60, 81 to 90, 111 to 120, and 141 to 150. Table 1 summarizes the clone number (HP number), the cells  
10 from which the cDNA clone was obtained, the total base number of the cDNA, and the number of the amino acid residues of the encoded protein, for each of the cDNAs.

Table 1

SEQ ID NO	HP number	Cells	Base number	Number of amino acid residues
1, 11, 21	HP02539	Saos-2	4485	647
2, 12, 22	HP02770	HT-1080	1509	350
3, 13, 23	HP02869	KB	3059	206
4, 14, 24	HP02956	KB	2367	213
5, 15, 25	HP02962	KB	2355	595
6, 16, 26	HP03014	Liver	1024	264
7, 17, 27	HP10608	Saos-2	1237	343
8, 18, 28	HP10609	KB	1332	244
9, 19, 29	HP10611	KB	1932	303
10, 20, 30	HP10617	HT-1080	1124	160
31, 41, 51	HP02837	HT-1080	4473	1445
32, 42, 52	HP02991	KB	2630	582
33, 43, 53	HP03063	HT-1080	1472	410
34, 44, 54	HP03091	Liver	1652	483
35, 45, 55	HP03092	Liver	2112	607
36, 46, 56	HP03116	KB	1087	314
37, 47, 57	HP10618	HT-1080	1694	94
38, 48, 58	HP10619	HT-1080	1522	218
39, 49, 59	HP10622	Liver	1591	460
40, 50, 60	HP10625	Liver	1249	216
61, 71, 81	HP02883	KB	4027	392
62, 72, 82	HP03140	HT-1080	2495	497
63, 73, 83	HP10628	HT-1080	1617	417
64, 74, 84	HP10629	WERI-RB	3269	649
65, 75, 85	HP10635	WERI-RB	458	93
66, 76, 86	HP10636	HT-1080	1712	425
67, 77, 87	HP10640	WERI-RB	1055	149
68, 78, 88	HP10644	WERI-RB	1616	396
69, 79, 89	HP10656	PMA-U937	1860	350
70, 80, 90	HP10672	Thymus	783	153
91, 101, 111	HP03194	KB	3438	303

92, 102, 112	HP03219	PMA-U937	1144	283
93, 103, 113	HP03236	HT-1080	2339	488
94, 104, 114	HP03237	HT-1080	1765	182
95, 105, 115	HP03267	Liver	1418	184
96, 106, 116	HP03270	PMA-U937	1211	140
97, 107, 117	HP03298	PMA-U937	1099	153
98, 108, 118	HP10631	WERI-RB	3489	173
99, 109, 119	HP10658	HT-1080	931	75
100, 110, 120	HP10663	PMA-U937	1123	159
121, 131, 141	HP03165	KB	3234	636
122, 132, 142	HP03266	HT-1080	2490	318
123, 133, 143	HP03287	Thymus	1465	82
124, 134, 144	HP10665	HT-1080	917	247
125, 135, 145	HP10669	WERI-RB	1306	206
126, 136, 146	HP10670	WERI-RB	2022	432
127, 137, 147	HP10671	Thymus	1227	306
128, 138, 148	HP10673	Thymus	2210	555
129, 139, 149	HP10675	Thymus	1493	250
130, 140, 150	HP10683	PMA-U937	1264	174

The same clones as the cDNAs of the present invention  
 can be easily obtained by screening the cDNA libraries  
 constructed from the human cell lines or human tissues  
 5 utilized in the present invention using an oligonucleotide  
 probe synthesized on the basis of the base sequence of the  
 cDNA provided in any one of SEQ ID NOS: 11 to 30, 41 to 60,  
 71 to 90, 101 to 120, and 131 to 150.

In general, the polymorphism due to the individual  
 10 differences is frequently observed in human genes.  
 Accordingly, any cDNA in which one or plural nucleotides are  
 added, deleted and/or substituted with other nucleotides in  
 SEQ ID NOS: 11 to 30, 41 to 60, 71 to 90, 101 to 120, and  
 131 to 150 shall come within the scope of the present

invention.

Similarly, any protein in which one or plural amino acids are added, deleted and/or substituted with other amino acids resulting from the above-mentioned changes shall come  
5 within the scope of the present invention, as long as the protein possesses the activity of the protein having any one of the amino acid sequences represented by SEQ ID NOS: 1 to 10, 31 to 40, 61 to 70, 91 to 100, and 121 to 130.

The cDNAs of the present invention also include cDNA  
10 fragments (of 10 bp or more) containing any partial base sequence in the base sequences represented by SEQ ID NOS: 11 to 20, 41 to 50, 71 to 80, 101 to 110, and 131 to 140 or in the base sequences represented by SEQ ID NOS: 21 to 30, 51 to 60, 81 to 90, 111 to 120, and 141 to 150. Also, DNA  
15 fragments consisting of a sense strand and an anti-sense strand shall come within this scope. These DNA fragments can be utilized as the probes for the genetic diagnosis.

In addition to the activities and uses described above, the polynucleotides and proteins of the present invention  
20 may exhibit one or more of the uses or biological activities (including those associated with assays cited herein) identified below. Uses or activities described for proteins of the present invention may be provided by administration or use of such proteins or by administration or use of  
25 polynucleotides encoding such proteins (such as, for example, in gene therapies or vectors suitable for introduction of DNA).

#### Research Uses and Utilities

The polynucleotides provided by the present invention  
30 can be used by the research community for various purposes. The polynucleotides can be used to express recombinant protein for analysis, characterization or therapeutic use;

as markers for tissues in which the corresponding protein is preferentially expressed (either constitutively or at a particular stage of tissue differentiation or development or in disease states); as molecular weight markers on Southern  
5 gels; as chromosome markers or tags (when labeled) to identify chromosomes or to map related gene positions; to compare with endogenous DNA sequences in patients to identify potential genetic disorders; as probes to hybridize and thus discover novel, related DNA sequences; as a source  
10 of information to derive PCR primers for genetic fingerprinting; as a probe to "subtract-out" known sequences in the process of discovering other novel polynucleotides; for selecting and making oligomers for attachment to a "gene chip" or other support, including for examination of  
15 expression patterns; to raise anti-protein antibodies using DNA immunization techniques; and as an antigen to raise anti-DNA antibodies or elicit another immune response. Where the polynucleotide encodes a protein which binds or potentially binds to another protein (such as, for example,  
20 in a receptor-ligand interaction), the polynucleotide can also be used in interaction trap assays (such as, for example, that described in Gyuris et al., Cell 75:791-803 (1993)) to identify polynucleotides encoding the other protein with which binding occurs or to identify inhibitors  
25 of the binding interaction.

The proteins provided by the present invention can similarly be used in assay to determine biological activity, including in a panel of multiple proteins for high-throughput screening; to raise antibodies or to elicit  
30 another immune response; as a reagent (including the labeled reagent) in assays designed to quantitatively determine levels of the protein (or its receptor) in biological

fluids; as markers for tissues in which the corresponding protein is preferentially expressed (either constitutively or at a particular stage of tissue differentiation or development or in a disease state); and, of course, to  
5 isolate correlative receptors or ligands. Where the protein binds or potentially binds to another protein (such as, for example, in a receptor-ligand interaction), the protein can be used to identify the other protein with which binding occurs or to identify inhibitors of the binding interaction.  
10 Proteins involved in these binding interactions can also be used to screen for peptide or small molecule inhibitors or agonists of the binding interaction.

Any or all of these research utilities are capable of being developed into reagent grade or kit format for  
15 commercialization as research products.

Methods for performing the uses listed above are well known to those skilled in the art. References disclosing such methods include without limitation "Molecular Cloning: A Laboratory Manual", 2d ed., Cold Spring Harbor Laboratory  
20 Press, Sambrook, J., E.F. Fritsch and T. Maniatis eds., 1989, and "Methods in Enzymology: Guide to Molecular Cloning Techniques", Academic Press, Berger, S.L. and A.R. Kimmel eds., 1987.

#### Nutritional Uses

25 Polynucleotides and proteins of the present invention can also be used as nutritional sources or supplements. Such uses include without limitation use as a protein or amino acid supplement, use as a carbon source, use as a nitrogen source and use as a source of carbohydrate. In such cases  
30 the protein or polynucleotide of the invention can be added to the feed of a particular organism or can be administered as a separate solid or liquid preparation, such as in the

form of powder, pills, solutions, suspensions or capsules. In the case of microorganisms, the protein or polynucleotide of the invention can be added to the medium in or on which the microorganism is cultured.

5        Cytokine and Cell Proliferation/Differentiation  
      Activity

A protein of the present invention may exhibit cytokine, cell proliferation (either inducing or inhibiting) or cell differentiation (either inducing or inhibiting) activity or  
10 may induce production of other cytokines in certain cell populations. Many protein factors discovered to date, including all known cytokines, have exhibited activity in one or more factor dependent cell proliferation assays, and hence the assays serve as a convenient confirmation of  
15 cytokine activity. The activity of a protein of the present invention is evidenced by any one of a number of routine factor dependent cell proliferation assays for cell lines including, without limitation, 32D, DA2, DA1G, T10, B9, B9/11, BaF3, MC9/G, M+ (preB M+), 2E8, RB5, DA1, 123, T1165,  
20 HT2, CTLL2, TF-1, Mo7e and CMK.

The activity of a protein of the invention may, among other means, be measured by the following methods:

Assays for T-cell or thymocyte proliferation include without limitation those described in: Current Protocols in  
25 Immunology, Ed by J. E. Coligan, A.M. Kruisbeek, D.H. Margulies, E.M. Shevach, W Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 3, In Vitro assays for Mouse Lymphocyte Function 3.1-3.19; Chapter 7, Immunologic studies in Humans); Takai et al., J. Immunol.  
30 137:3494-3500, 1986; Bertagnolli et al., J. Immunol. 145:1706-1712, 1990; Bertagnolli et al., Cellular Immunology 133:327-341, 1991; Bertagnolli, et al., J. Immunol.



149:3778-3783, 1992; Bowman et al., J. Immunol. 152: 1756-1761, 1994.

Assays for cytokine production and/or proliferation of spleen cells, lymph node cells or thymocytes include, without limitation, those described in: Polyclonal T cell stimulation, Kruisbeek, A.M. and Shevach, E.M. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 3.12.1-3.12.14, John Wiley and Sons, Toronto. 1994; and Measurement of mouse and human Interferon  $\gamma$ , Schreiber, R.D. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 6.8.1-6.8.8, John Wiley and Sons, Toronto. 1994.

Assays for proliferation and differentiation of hematopoietic and lymphopoietic cells include, without limitation, those described in: Measurement of Human and Murine Interleukin 2 and Interleukin 4, Bottomly, K., Davis, L.S. and Lipsky, P.E. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 6.3.1-6.3.12, John Wiley and Sons, Toronto. 1991; deVries et al., J. Exp. Med. 173:1205-1211, 1991; Moreau et al., Nature 336:690-692, 1988; Greenberger et al., Proc. Natl. Acad. Sci. U.S.A. 80:2931-2938, 1983; Measurement of mouse and human interleukin 6 - Nordan, R. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 6.6.1-6.6.5, John Wiley and Sons, Toronto. 1991; Smith et al., Proc. Natl. Acad. Sci. U.S.A. 83:1857-1861, 1986; Measurement of human Interleukin 11 - Bennett, F., Giannotti, J., Clark, S.C. and Turner, K. J. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 6.15.1 John Wiley and Sons, Toronto. 1991; Measurement of mouse and human Interleukin 9 - Ciarletta, A., Giannotti, J., Clark, S.C. and Turner, K.J. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 6.13.1, John Wiley and Sons, Toronto. 1991.

Assays for T-cell clone responses to antigens (which will identify, among others, proteins that affect APC-T cell interactions as well as direct T-cell effects by measuring proliferation and cytokine production) include, without  
5 limitation, those described in: Current Protocols in Immunology, Ed by J. E. Coligan, A.M. Kruisbeek, D.H. Margulies, E.M. Shevach, W Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 3, In Vitro assays for Mouse Lymphocyte Function; Chapter 6, Cytokines  
10 and their cellular receptors; Chapter 7, Immunologic studies in Humans); Weinberger et al., Proc. Natl. Acad. Sci. USA 77:6091-6095, 1980; Weinberger et al., Eur. J. Immun. 11:405-411, 1981; Takai et al., J. Immunol. 137:3494-3500, 1986; Takai et al., J. Immunol. 140:508-512, 1988.

15 Immune Stimulating or Suppressing Activity

A protein of the present invention may also exhibit immune stimulating or immune suppressing activity, including without limitation the activities for which assays are described herein. A protein may be useful in the treatment  
20 of various immune deficiencies and disorders (including severe combined immunodeficiency (SCID)), e.g., in regulating (up or down) growth and proliferation of T and/or B lymphocytes, as well as effecting the cytolytic activity of NK cells and other cell populations. These immune  
25 deficiencies may be genetic or be caused by viral (e.g., HIV) as well as bacterial or fungal infections, or may result from autoimmune disorders. More specifically, infectious diseases caused by viral, bacterial, fungal or other infection may be treatable using a protein of the  
30 present invention, including infections by HIV, hepatitis viruses, herpesviruses, mycobacteria, Leishmania spp., malaria spp. and various fungal infections such as

candidiasis. Of course, in this regard, a protein of the present invention may also be useful where a boost to the immune system generally may be desirable, i.e., in the treatment of cancer.

5        Autoimmune disorders which may be treated using a protein of the present invention include, for example, connective tissue disease, multiple sclerosis, systemic lupus erythematosus, rheumatoid arthritis, autoimmune pulmonary inflammation, Guillain-Barre syndrome, autoimmune  
10    thyroiditis, insulin dependent diabetes mellitis, myasthenia gravis, graft-versus-host disease and autoimmune inflammatory eye disease. Such a protein of the present invention may also to be useful in the treatment of allergic reactions and conditions, such as asthma (particularly  
15    allergic asthma) or other respiratory problems. Other conditions, in which immune suppression is desired (including, for example, organ transplantation), may also be treatable using a protein of the present invention.

      Using the proteins of the invention it may also be  
20    possible to immune responses, in a number of ways. Down regulation may be in the form of inhibiting or blocking an immune response already in progress or may involve preventing the induction of an immune response. The functions of activated T cells may be inhibited by  
25    suppressing T cell responses or by inducing specific tolerance in T cells, or both. Immunosuppression of T cell responses is generally an active, non-antigen-specific, process which requires continuous exposure of the T cells to the suppressive agent. Tolerance, which involves inducing  
30    non-responsiveness or anergy in T cells, is distinguishable from immunosuppression in that it is generally antigen-specific and persists after exposure to the tolerizing agent

has ceased. Operationally, tolerance can be demonstrated by the lack of a T cell response upon reexposure to specific antigen in the absence of the tolerizing agent.

Down regulating or preventing one or more antigen  
5 functions (including without limitation B lymphocyte antigen functions (such as , for example, B7)), e.g., preventing high level lymphokine synthesis by activated T cells, will be useful in situations of tissue, skin and organ transplantation and in graft-versus-host disease (GVHD). For  
10 example, blockage of T cell function should result in reduced tissue destruction in tissue transplantation. Typically, in tissue transplants, rejection of the transplant is initiated through its recognition as foreign by T cells, followed by an immune reaction that destroys the  
15 transplant. The administration of a molecule which inhibits or blocks interaction of a B7 lymphocyte antigen with its natural ligand(s) on immune cells (such as a soluble, monomeric form of a peptide having B7-2 activity alone or in conjunction with a monomeric form of a peptide having an  
20 activity of another B lymphocyte antigen (e.g., B7-1, B7-3) or blocking antibody), prior to transplantation can lead to the binding of the molecule to the natural ligand(s) on the immune cells without transmitting the corresponding costimulatory signal. Blocking B lymphocyte antigen function  
25 in this matter prevents cytokine synthesis by immune cells, such as T cells, and thus acts as an immunosuppressant. Moreover, the lack of costimulation may also be sufficient to anergize the T cells, thereby inducing tolerance in a subject. Induction of long-term tolerance by B lymphocyte  
30 antigen-blocking reagents may avoid the necessity of repeated administration of these blocking reagents. To achieve sufficient immunosuppression or tolerance in a

subject, it may also be necessary to block the function of a combination of B lymphocyte antigens.

The efficacy of particular blocking reagents in preventing organ transplant rejection or GVHD can be assessed using animal models that are predictive of efficacy in humans. Examples of appropriate systems which can be used include allogeneic cardiac grafts in rats and xenogeneic pancreatic islet cell grafts in mice, both of which have been used to examine the immunosuppressive effects of CTLA4Ig fusion proteins in vivo as described in Lenschow et al., Science 257:789-792 (1992) and Turka et al., Proc. Natl. Acad. Sci USA, 89:11102-11105 (1992). In addition, murine models of GVHD (see Paul ed., Fundamental Immunology, Raven Press, New York, 1989, pp. 846-847) can be used to determine the effect of blocking B lymphocyte antigen function in vivo on the development of that disease.

Blocking antigen function may also be therapeutically useful for treating autoimmune diseases. Many autoimmune disorders are the result of inappropriate activation of T cells that are reactive against self tissue and which promote the production of cytokines and autoantibodies involved in the pathology of the diseases. Preventing the activation of autoreactive T cells may reduce or eliminate disease symptoms. Administration of reagents which block costimulation of T cells by disrupting receptor:ligand interactions of B lymphocyte antigens can be used to inhibit T cell activation and prevent production of autoantibodies or T cell-derived cytokines which may be involved in the disease process. Additionally, blocking reagents may induce antigen-specific tolerance of autoreactive T cells which could lead to long-term relief from the disease. The efficacy of blocking reagents in preventing or alleviating

autoimmune disorders can be determined using a number of well-characterized animal models of human autoimmune diseases. Examples include murine experimental autoimmune encephalitis, systemic lupus erythmatosis in MRL/lpr/lpr mice or NZB hybrid mice, murine autoimmune collagen arthritis, diabetes mellitus in NOD mice and BB rats, and murine experimental myasthenia gravis (see Paul ed., Fundamental Immunology, Raven Press, New York, 1989, pp. 840-856).

Upregulation of an antigen function (preferably a B lymphocyte antigen function), as a means of up regulating immune responses, may also be useful in therapy. Upregulation of immune responses may be in the form of enhancing an existing immune response or eliciting an initial immune response. For example, enhancing an immune response through stimulating B lymphocyte antigen function may be useful in cases of viral infection. In addition, systemic viral diseases such as influenza, the common cold, and encephalitis might be alleviated by the administration of stimulatory forms of B lymphocyte antigens systemically.

Alternatively, anti-viral immune responses may be enhanced in an infected patient by removing T cells from the patient, costimulating the T cells in vitro with viral antigen-pulsed APCs either expressing a peptide of the present invention or together with a stimulatory form of a soluble peptide of the present invention and reintroducing the in vitro activated T cells into the patient. Another method of enhancing anti-viral immune responses would be to isolate infected cells from a patient, transfect them with a nucleic acid encoding a protein of the present invention as described herein such that the cells express all or a portion of the protein on their surface, and reintroduce the

transfected cells into the patient. The infected cells would now be capable of delivering a costimulatory signal to, and thereby activate, T cells in vivo.

In another application, up regulation or enhancement of antigen function (preferably B lymphocyte antigen function) may be useful in the induction of tumor immunity. Tumor cells (e.g., sarcoma, melanoma, lymphoma, leukemia, neuroblastoma, carcinoma) transfected with a nucleic acid encoding at least one peptide of the present invention can be administered to a subject to overcome tumor-specific tolerance in the subject. If desired, the tumor cell can be transfected to express a combination of peptides. For example, tumor cells obtained from a patient can be transfected ex vivo with an expression vector directing the expression of a peptide having B7-2-like activity alone, or in conjunction with a peptide having B7-1-like activity and/or B7-3-like activity. The transfected tumor cells are returned to the patient to result in expression of the peptides on the surface of the transfected cell. Alternatively, gene therapy techniques can be used to target a tumor cell for transfection in vivo.

The presence of the peptide of the present invention having the activity of a B lymphocyte antigen(s) on the surface of the tumor cell provides the necessary costimulation signal to T cells to induce a T cell mediated immune response against the transfected tumor cells. In addition, tumor cells which lack MHC class I or MHC class II molecules, or which fail to reexpress sufficient amounts of MHC class I or MHC class II molecules, can be transfected with nucleic acid encoding all or a portion of (e.g., a cytoplasmic-domain truncated portion) of an MHC class I  $\alpha$  chain protein and  $\beta$ , microglobulin protein or an MHC class

II  $\alpha$  chain protein and an MHC class II  $\beta$  chain protein to thereby express MHC class I or MHC class II proteins on the cell surface. Expression of the appropriate class I or class II MHC in conjunction with a peptide having the activity of a B lymphocyte antigen (e.g., B7-1, B7-2, B7-3) induces a T cell mediated immune response against the transfected tumor cell. Optionally, a gene encoding an antisense construct which blocks expression of an MHC class II associated protein, such as the invariant chain, can also be cotransfected with a DNA encoding a peptide having the activity of a B lymphocyte antigen to promote presentation of tumor associated antigens and induce tumor specific immunity. Thus, the induction of a T cell mediated immune response in a human subject may be sufficient to overcome tumor-specific tolerance in the subject.

The activity of a protein of the invention may, among other means, be measured by the following methods:

Suitable assays for thymocyte or splenocyte cytotoxicity include, without limitation, those described in: Current Protocols in Immunology, Ed by J. E. Coligan, A.M. Kruisbeek, D.H. Margulies, E.M. Shevach, W Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 3, In Vitro assays for Mouse Lymphocyte Function 3.1-3.19; Chapter 7, Immunologic studies in Humans); Herrmann et al., Proc. Natl. Acad. Sci. USA 78:2488-2492, 1981; Herrmann et al., J. Immunol. 128:1968-1974, 1982; Handa et al., J. Immunol. 135:1564-1572, 1985; Takai et al., J. Immunol. 137:3494-3500, 1986; Takai et al., J. Immunol. 140:508-512, 1988; Herrmann et al., Proc. Natl. Acad. Sci. USA 78:2488-2492, 1981; Herrmann et al., J. Immunol. 128:1968-1974, 1982; Handa et al., J. Immunol. 135:1564-1572, 1985; Takai et al., J. Immunol. 137:3494-3500, 1986; Bowman et al., J.



Virology 61:1992-1998; Takai et al., J. Immunol. 140:508-512, 1988; Bertagnolli et al., Cellular Immunology 133:327-341, 1991; Brown et al., J. Immunol. 153:3079-3092, 1994.

Assays for T-cell-dependent immunoglobulin responses  
5 and isotype switching (which will identify, among others, proteins that modulate T-cell dependent antibody responses and that affect Th1/Th2 profiles) include, without limitation, those described in: Maliszewski, J. Immunol. 144:3028-3033, 1990; and Assays for B cell function: In  
10 vitro antibody production, Mond, J.J. and Brunswick, M. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 3.8.1-3.8.16, John Wiley and Sons, Toronto. 1994.

Mixed lymphocyte reaction (MLR) assays (which will identify, among others, proteins that generate predominantly  
15 Th1 and CTL responses) include, without limitation, those described in: Current Protocols in Immunology, Ed by J. E. Coligan, A.M. Kruisbeek, D.H. Margulies, E.M. Shevach, W Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 3, In Vitro assays for Mouse  
20 Lymphocyte Function 3.1-3.19; Chapter 7, Immunologic studies in Humans); Takai et al., J. Immunol. 137:3494-3500, 1986; Takai et al., J. Immunol. 140:508-512, 1988; Bertagnolli et al., J. Immunol. 149:3778-3783, 1992.

Dendritic cell-dependent assays (which will identify,  
25 among others, proteins expressed by dendritic cells that activate naive T-cells) include, without limitation, those described in: Guery et al., J. Immunol. 134:536-544, 1995; Inaba et al., Journal of Experimental Medicine 173:549-559, 1991; Macatonia et al., Journal of Immunology 154:5071-5079, 1995; Porgador et al., Journal of Experimental Medicine  
30 182:255-260, 1995; Nair et al., Journal of Virology 67:4062-4069, 1993; Huang et al., Science 264:961-965, 1994;

Macatonia et al., Journal of Experimental Medicine 169:1255-1264, 1989; Bhardwaj et al., Journal of Clinical Investigation 94:797-807, 1994; and Inaba et al., Journal of Experimental Medicine 172:631-640, 1990.

5        Assays for lymphocyte survival/apoptosis (which will identify, among others, proteins that prevent apoptosis after superantigen induction and proteins that regulate lymphocyte homeostasis) include, without limitation, those described in: Darzynkiewicz et al., Cytometry 13:795-808,  
10       1992; Gorczyca et al., Leukemia 7:659-670, 1993; Gorczyca et al., Cancer Research 53:1945-1951, 1993; Itoh et al., Cell 66:233-243, 1991; Zacharchuk, Journal of Immunology 145:4037-4045, 1990; Zamai et al., Cytometry 14:891-897, 1993; Gorczyca et al., International Journal of Oncology  
15       1:639-648, 1992.

      Assays for proteins that influence early steps of T-cell commitment and development include, without limitation, those described in: Antica et al., Blood 84:111-117, 1994; Fine et al., Cellular Immunology 155:111-122, 1994; Galy et  
20       al., Blood 85:2770-2778, 1995; Toki et al., Proc. Nat. Acad Sci. USA 88:7548-7551, 1991.

#### Hematopoiesis Regulating Activity

      A protein of the present invention may be useful in regulation of hematopoiesis and, consequently, in the  
25       treatment of myeloid or lymphoid cell deficiencies. Even marginal biological activity in support of colony forming cells or of factor-dependent cell lines indicates involvement in regulating hematopoiesis, e.g. in supporting the growth and proliferation of erythroid progenitor cells  
30       alone or in combination with other cytokines, thereby indicating utility, for example, in treating various anemias or for use in conjunction with irradiation/chemotherapy to

stimulate the production of erythroid precursors and/or erythroid cells; in supporting the growth and proliferation of myeloid cells such as granulocytes and monocytes/macrophages (i.e., traditional CSF activity) 5 useful, for example, in conjunction with chemotherapy to prevent or treat consequent myelo-suppression; in supporting the growth and proliferation of megakaryocytes and consequently of platelets thereby allowing prevention or treatment of various platelet disorders such as 10 thrombocytopenia, and generally for use in place of or complementary to platelet transfusions; and/or in supporting the growth and proliferation of hematopoietic stem cells which are capable of maturing to any and all of the above-mentioned hematopoietic cells and therefore find therapeutic 15 utility in various stem cell disorders (such as those usually treated with transplantation, including, without limitation, aplastic anemia and paroxysmal nocturnal hemoglobinuria), as well as in repopulating the stem cell compartment post irradiation/chemotherapy, either in-vivo or 20 ex-vivo (i.e., in conjunction with bone marrow transplantation or with peripheral progenitor cell transplantation (homologous or heterologous)) as normal cells or genetically manipulated for gene therapy.

The activity of a protein of the invention may, among 25 other means, be measured by the following methods:

Suitable assays for proliferation and differentiation of various hematopoietic lines are cited above.

Assays for embryonic stem cell differentiation (which will identify, among others, proteins that influence 30 embryonic differentiation hematopoiesis) include, without limitation, those described in: Johansson et al. Cellular Biology 15:141-151, 1995; Keller et al., Molecular and

Cellular Biology 13:473-486, 1993; McClanahan et al., Blood 81:2903-2915, 1993.

Assays for stem cell survival and differentiation (which will identify, among others, proteins that regulate lympho-hematopoiesis) include, without limitation, those described in: Methylcellulose colony forming assays, Freshney, M.G. In Culture of Hematopoietic Cells. R.I. Freshney, et al. eds. Vol pp. 265-268, Wiley-Liss, Inc., New York, NY. 1994; Hirayama et al., Proc. Natl. Acad. Sci. USA 89:5907-5911, 1992; Primitive hematopoietic colony forming cells with high proliferative potential, McNiece, I.K. and Briddell, R.A. In Culture of Hematopoietic Cells. R.I. Freshney, et al. eds. Vol pp. 23-39, Wiley-Liss, Inc., New York, NY. 1994; Neben et al., Experimental Hematology 22:353-359, 1994; Cobblestone area forming cell assay, Ploemacher, R.E. In Culture of Hematopoietic Cells. R.I. Freshney, et al. eds. Vol pp. 1-21, Wiley-Liss, Inc., New York, NY. 1994; Long term bone marrow cultures in the presence of stromal cells, Spooncer, E., Dexter, M. and Allen, T. In Culture of Hematopoietic Cells. R.I. Freshney, et al. eds. Vol pp. 163-179, Wiley-Liss, Inc., New York, NY. 1994; Long term culture initiating cell assay, Sutherland, H.J. In Culture of Hematopoietic Cells. R.I. Freshney, et al. eds. Vol pp. 139-162, Wiley-Liss, Inc., New York, NY. 1994.

#### Tissue Growth Activity

A protein of the present invention also may have utility in compositions used for bone, cartilage, tendon, ligament and/or nerve tissue growth or regeneration, as well as for wound healing and tissue repair and replacement, and in the treatment of burns, incisions and ulcers.

A protein of the present invention, which induces cartilage and/or bone growth in circumstances where bone is

not normally formed, has application in the healing of bone fractures and cartilage damage or defects in humans and other animals. Such a preparation employing a protein of the invention may have prophylactic use in closed as well as  
5 open fracture reduction and also in the improved fixation of artificial joints. De novo bone formation induced by an osteogenic agent contributes to the repair of congenital, trauma induced, or oncologic resection induced craniofacial defects, and also is useful in cosmetic plastic surgery.

10 A protein of this invention may also be used in the treatment of periodontal disease, and in other tooth repair processes. Such agents may provide an environment to attract bone-forming cells, stimulate growth of bone-forming cells or induce differentiation of progenitors of bone-forming  
15 cells. A protein of the invention may also be useful in the treatment of osteoporosis or osteoarthritis, such as through stimulation of bone and/or cartilage repair or by blocking inflammation or processes of tissue destruction (collagenase activity, osteoclast activity, etc.) mediated by  
20 inflammatory processes.

Another category of tissue regeneration activity that may be attributable to the protein of the present invention is tendon/ligament formation. A protein of the present invention, which induces tendon/ligament-like tissue or  
25 other tissue formation in circumstances where such tissue is not normally formed, has application in the healing of tendon or ligament tears, deformities and other tendon or ligament defects in humans and other animals. Such a preparation employing a tendon/ligament-like tissue inducing  
30 protein may have prophylactic use in preventing damage to tendon or ligament tissue, as well as use in the improved fixation of tendon or ligament to bone or other tissues, and

in repairing defects to tendon or ligament tissue. De novo tendon/ligament-like tissue formation induced by a composition of the present invention contributes to the repair of congenital, trauma induced, or other tendon or  
5 ligament defects of other origin, and is also useful in cosmetic plastic surgery for attachment or repair of tendons or ligaments. The compositions of the present invention may provide an environment to attract tendon or ligament-forming cells, stimulate growth of tendon- or ligament-forming cells,  
10 induce differentiation of progenitors of tendon- or ligament-forming cells, or induce growth of tendon/ligament cells or progenitors ex vivo for return in vivo to effect tissue repair. The compositions of the invention may also be useful in the treatment of tendinitis, carpal tunnel  
15 syndrome and other tendon or ligament defects. The compositions may also include an appropriate matrix and/or sequestering agent as a carrier as is well known in the art.

The protein of the present invention may also be useful for proliferation of neural cells and for regeneration of  
20 nerve and brain tissue, i.e. for the treatment of central and peripheral nervous system diseases and neuropathies, as well as mechanical and traumatic disorders, which involve degeneration, death or trauma to neural cells or nerve tissue. More specifically, a protein may be used in the  
25 treatment of diseases of the peripheral nervous system, such as peripheral nerve injuries, peripheral neuropathy and localized neuropathies, and central nervous system diseases, such as Alzheimer's, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis, and Shy-Drager  
30 syndrome. Further conditions which may be treated in accordance with the present invention include mechanical and traumatic disorders, such as spinal cord disorders, head

trauma and cerebrovascular diseases such as stroke. Peripheral neuropathies resulting from chemotherapy or other medical therapies may also be treatable using a protein of the invention.

5 Proteins of the invention may also be useful to promote better or faster closure of non-healing wounds, including without limitation pressure ulcers, ulcers associated with vascular insufficiency, surgical and traumatic wounds and the like.

10 It is expected that a protein of the present invention may also exhibit activity for generation or regeneration of other tissues, such as organs (including, for example, pancreas, liver, intestine, kidney, skin, endothelium), muscle (smooth, skeletal or cardiac) and vascular (including  
15 vascular endothelium) tissue, or for promoting the growth of cells comprising such tissues. Part of the desired effects may be by inhibition or modulation of fibrotic scarring to allow normal tissue to regenerate. A protein of the invention may also exhibit angiogenic activity.

20 A protein of the present invention may also be useful for gut protection or regeneration and treatment of lung or liver fibrosis, reperfusion injury in various tissues, and conditions resulting from systemic cytokine damage.

A protein of the present invention may also be useful  
25 for promoting or inhibiting differentiation of tissues described above from precursor tissues or cells; or for inhibiting the growth of tissues described above.

The activity of a protein of the invention may, among other means, be measured by the following methods:

30 Assays for tissue generation activity include, without limitation, those described in: International Patent Publication No. WO95/16035 (bone, cartilage, tendon);

International Patent Publication No. WO95/05846 (nerve, neuronal); International Patent Publication No. WO91/07491 (skin, endothelium ).

Assays for wound healing activity include, without  
5 limitation, those described in: Winter, Epidermal Wound Healing, pps. 71-112 (Maibach, HI and Rovee, DT, eds.), Year Book Medical Publishers, Inc., Chicago, as modified by Eaglstein and Mertz, J. Invest. Dermatol 71:382-84 (1978).

#### Activin/Inhibin Activity

10 A protein of the present invention may also exhibit activin- or inhibin-related activities. Inhibins are characterized by their ability to inhibit the release of follicle stimulating hormone (FSH), while activins and are characterized by their ability to stimulate the release of  
15 follicle stimulating hormone (FSH). Thus, a protein of the present invention, alone or in heterodimers with a member of the inhibin  $\alpha$  family, may be useful as a contraceptive based on the ability of inhibins to decrease fertility in female mammals and decrease spermatogenesis in male mammals.  
20 Administration of sufficient amounts of other inhibins can induce infertility in these mammals. Alternatively, the protein of the invention, as a homodimer or as a heterodimer with other protein subunits of the inhibin- $\beta$  group, may be useful as a fertility inducing therapeutic, based upon the  
25 ability of activin molecules in stimulating FSH release from cells of the anterior pituitary. See, for example, United States Patent 4,798,885. A protein of the invention may also be useful for advancement of the onset of fertility in sexually immature mammals, so as to increase the lifetime  
30 reproductive performance of domestic animals such as cows, sheep and pigs.

The activity of a protein of the invention may, among



other means, be measured by the following methods:

Assays for activin/inhibin activity include, without limitation, those described in: Vale et al., Endocrinology 91:562-572, 1972; Ling et al., Nature 321:779-782, 1986; 5 Vale et al., Nature 321:776-779, 1986; Mason et al., Nature 318:659-663, 1985; Forage et al., Proc. Natl. Acad. Sci. USA 83:3091-3095, 1986.

Chemotactic/Chemokinetic Activity

A protein of the present invention may have chemotactic 10 or chemokinetic activity (e.g., act as a chemokine) for mammalian cells, including, for example, monocytes, fibroblasts, neutrophils, T-cells, mast cells, eosinophils, epithelial and/or endothelial cells. Chemotactic and chemokinetic proteins can be used to mobilize or attract a 15 desired cell population to a desired site of action. Chemotactic or chemokinetic proteins provide particular advantages in treatment of wounds and other trauma to tissues, as well as in treatment of localized infections. For example, attraction of lymphocytes, monocytes or 20 neutrophils to tumors or sites of infection may result in improved immune responses against the tumor or infecting agent.

A protein or peptide has chemotactic activity for a particular cell population if it can stimulate, directly or 25 indirectly, the directed orientation or movement of such cell population. Preferably, the protein or peptide has the ability to directly stimulate directed movement of cells. Whether a particular protein has chemotactic activity for a population of cells can be readily determined by employing 30 such protein or peptide in any known assay for cell chemotaxis.

The activity of a protein of the invention may, among

other means, be measured by the following methods:

Assays for chemotactic activity (which will identify proteins that induce or prevent chemotaxis) consist of assays that measure the ability of a protein to induce the migration of cells across a membrane as well as the ability of a protein to induce the adhesion of one cell population to another cell population. Suitable assays for movement and adhesion include, without limitation, those described in: Current Protocols in Immunology, Ed by J.E. Coligan, A.M. Kruisbeek, D.H. Margulies, E.M. Shevach, W. Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 6.12, Measurement of alpha and beta Chemokines 6.12.1-6.12.28; Taub et al. J. Clin. Invest. 95:1370-1376, 1995; Lind et al. APMIS 103:140-146, 1995; Muller et al Eur. J. Immunol. 25: 1744-1748; Gruber et al. J. of Immunol. 152:5860-5867, 1994; Johnston et al. J. of Immunol. 153: 1762-1768, 1994.

#### Hemostatic and Thrombolytic Activity

A protein of the invention may also exhibit hemostatic or thrombolytic activity. As a result, such a protein is expected to be useful in treatment of various coagulation disorders (including hereditary disorders, such as hemophilias) or to enhance coagulation and other hemostatic events in treating wounds resulting from trauma, surgery or other causes. A protein of the invention may also be useful for dissolving or inhibiting formation of thromboses and for treatment and prevention of conditions resulting therefrom (such as, for example, infarction of cardiac and central nervous system vessels (e.g., stroke)).

The activity of a protein of the invention may, among other means, be measured by the following methods:

Assay for hemostatic and thrombolytic activity include,

without limitation, those described in: Linet et al., J. Clin. Pharmacol. 26:131-140, 1986; Burdick et al., Thrombosis Res. 45:413-419, 1987; Humphrey et al., Fibrinolysis 5:71-79 (1991); Schaub, Prostaglandins 35:467-474, 1988.

#### Receptor/Ligand Activity

A protein of the present invention may also demonstrate activity as receptors, receptor ligands or inhibitors or agonists of receptor/ligand interactions. Examples of such receptors and ligands include, without limitation, cytokine receptors and their ligands, receptor kinases and their ligands, receptor phosphatases and their ligands, receptors involved in cell-cell interactions and their ligands (including without limitation, cellular adhesion molecules (such as selectins, integrins and their ligands) and receptor/ligand pairs involved in antigen presentation, antigen recognition and development of cellular and humoral immune responses). Receptors and ligands are also useful for screening of potential peptide or small molecule inhibitors of the relevant receptor/ligand interaction. A protein of the present invention (including, without limitation, fragments of receptors and ligands) may themselves be useful as inhibitors of receptor/ligand interactions.

The activity of a protein of the invention may, among other means, be measured by the following methods:

Suitable assays for receptor-ligand activity include without limitation those described in: Current Protocols in Immunology, Ed by J.E. Coligan, A.M. Kruisbeek, D.H. Margulies, E.M. Shevach, W.Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 7.28, Measurement of Cellular Adhesion under static conditions 7.28.1-7.28.22), Takai et al., Proc. Natl. Acad. Sci. USA 84:6864-6868, 1987;

Bierer et al., J. Exp. Med. 168:1145-1156, 1988; Rosenstein et al., J. Exp. Med. 169:149-160 1989; Stoltenborg et al., J. Immunol. Methods 175:59-68, 1994; Stitt et al., Cell 80:661-670, 1995.

5           Anti-Inflammatory Activity

Proteins of the present invention may also exhibit anti-inflammatory activity. The anti-inflammatory activity may be achieved by providing a stimulus to cells involved in the inflammatory response, by inhibiting or promoting cell-cell interactions (such as, for example, cell adhesion), by inhibiting or promoting chemotaxis of cells involved in the inflammatory process, inhibiting or promoting cell extravasation, or by stimulating or suppressing production of other factors which more directly inhibit or promote an inflammatory response. Proteins exhibiting such activities can be used to treat inflammatory conditions including chronic or acute conditions), including without limitation inflammation associated with infection (such as septic shock, sepsis or systemic inflammatory response syndrome (SIRS)), ischemia-reperfusion injury, endotoxin lethality, arthritis, complement-mediated hyperacute rejection, nephritis, cytokine or chemokine-induced lung injury, inflammatory bowel disease, Crohn's disease or resulting from over production of cytokines such as TNF or IL-1. Proteins of the invention may also be useful to treat anaphylaxis and hypersensitivity to an antigenic substance or material.

20           Tumor Inhibition Activity

In addition to the activities described above for immunological treatment or prevention of tumors, a protein of the invention may exhibit other anti-tumor activities. A protein may inhibit tumor growth directly or indirectly

(such as, for example, via ADCC). A protein may exhibit its tumor inhibitory activity by acting on tumor tissue or tumor precursor tissue, by inhibiting formation of tissues necessary to support tumor growth (such as, for example, by inhibiting angiogenesis), by causing production of other factors, agents or cell types which inhibit tumor growth, or by suppressing, eliminating or inhibiting factors, agents or cell types which promote tumor growth.

#### Other Activities

A protein of the invention may also exhibit one or more of the following additional activities or effects: inhibiting the growth, infection or function of, or killing, infectious agents, including, without limitation, bacteria, viruses, fungi and other parasites; effecting (suppressing or enhancing) bodily characteristics, including, without limitation, height, weight, hair color, eye color, skin, fat to lean ratio or other tissue pigmentation, or organ or body part size or shape (such as, for example, breast augmentation or diminution, change in bone form or shape); effecting biorhythms or circadian cycles or rhythms; effecting the fertility of male or female subjects; effecting the metabolism, catabolism, anabolism, processing, utilization, storage or elimination of dietary fat, lipid, protein, carbohydrate, vitamins, minerals, cofactors or other nutritional factors or component(s); effecting behavioral characteristics, including, without limitation, appetite, libido, stress, cognition (including cognitive disorders), depression (including depressive disorders) and violent behaviors; providing analgesic effects or other pain reducing effects; promoting differentiation and growth of embryonic stem cells in lineages other than hematopoietic

lineages; hormonal or endocrine activity; in the case of enzymes, correcting deficiencies of the enzyme and treating deficiency-related diseases; treatment of hyperproliferative disorders (such as, for example, psoriasis); immunoglobulin-like activity (such as, for example, the ability to bind antigens or complement); and the ability to act as an antigen in a vaccine composition to raise an immune response against such protein or another material or entity which is cross-reactive with such protein.

10

#### Examples

The present invention is specifically illustrated in more detail by the following Examples, but Examples are not intended to restrict the present invention. The basic procedures with regard to the recombinant DNA and the enzymatic reactions were carried out according to the literature ["Molecular Cloning. A Laboratory Manual", Cold Spring Harbor Laboratory, 1989]. Unless otherwise stated, restriction enzymes and various modifying enzymes to be used were those available from Takara Shuzo. The buffer compositions and the reaction conditions for each of the enzyme reactions were as described in the attached instructions. The cDNA synthesis was carried out according to the literature [Kato, S. et al., Gene 150: 243-250 (1994)].

25

#### (1) Selection of cDNAs Encoding Proteins Having Hydrophobic Domains

The cDNA library of fibrosarcoma cell line HT-1080 (WO 98/11217), the cDNA library of osteosarcoma cell line Saos-2 (WO 97/33993), the cDNA library of epidermoid carcinoma cell line KB (WO 98/11217) and the cDNA library of liver tissue delivered by the operation (WO 98/21328) were used as the

30

cdna libraries. Additionally, the cdna libraries constructed from phorbol ester-stimulated histiocytic lymphoma cell line U937 (ATCC CRL 1593) mRNA, human retinoblastoma cell line WERI-RB (ATCC HTB 169) mRNA and human thymus mRNA (Clontech) were also used. Full-length cdna clones were selected from the respective libraries and the whole base sequences thereof were determined to construct a homo-protein cdna bank consisting of the full-length cdna clones. The hydrophobicity/hydrophilicity profiles were determined for the proteins encoded by the full-length cdna clones registered in the homo-protein cdna bank by the Kyte-Doolittle method [Kyte, J. & Doolittle, R. F., J. Mol. Biol. 157: 105-132 (1982)] to examine the presence or absence of a hydrophobic region. A clone that has a hydrophobic region being assumed as a secretory signal or a transmembrane domain in the amino acid sequence of the encoded protein was selected as a clone candidate.

## (2) Protein Synthesis by In Vitro Translation

The plasmid vector bearing the cdna of the present invention was used for in vitro transcription/translation with a T<sub>7</sub>T rabbit reticulocyte lysate kit (Promega). In this case, [<sup>35</sup>S]methionine was added to label the expression product with a radioisotope. Each of the reactions was carried out according to the protocols attached to the kit. Two micrograms of the plasmid was subjected to the reaction at 30°C for 90 minutes in the reaction solution of a total volume of 25 µl containing 12.5 µl µ of T<sub>7</sub>T rabbit reticulocyte lysate, 0.5 µl of a buffer solution (attached to the kit), 2 µl of an amino acid mixture (without methionine), 2 µl of [<sup>35</sup>S]methionine (Amersham) (0.37 MBq/µl), 0.5 µl of T7 RNA polymerase, and 20 U of RNasin. The experiment in the presence of a membrane system was carried

out by adding 2.5  $\mu$ l of a canine pancreas microsome fraction (Promega) to the reaction system. To 3  $\mu$ l of the reaction solution was added 2  $\mu$ l of the SDS sampling buffer (125 mM Tris-hydrochloride buffer, pH 6.8, 120 mM 2-mercaptoethanol, 5 2% SDS solution, 0.025% bromophenol blue and 20% glycerol) and the resulting mixture was heated at 95°C for 3 minutes and then subjected to SDS-polyacrylamide gel electrophoresis. The molecular weight of the translation product was determined by carrying out the autoradiography.

10 (3) Expression in COS7

*Escherichia coli* cells harboring the expression vector for the protein of the present invention were cultured at 37°C for 2 hours in 2 ml of the 2xYT culture medium containing 100  $\mu$ g/ml of ampicillin, the helper phage M13K07 15 (50  $\mu$ l) was added, and the cells were then cultured at 37°C overnight. Single-stranded phage particles were obtained by polyethylene glycol precipitation from a supernatant separated by centrifugation. The particles were suspended in 100  $\mu$ l of 1 mM Tris-0.1 mM EDTA, pH 8 (TE).

20 The cultured cells derived from monkey kidney, COS7, were cultured at 37°C in the presence of 5% CO<sub>2</sub> in the Dulbecco's modified Eagle's medium (DMEM) containing 10% fetal calf serum.  $1 \times 10^5$  COS7 cells were inoculated into a 6-well plate (Nunc, well diameter: 3 cm) and cultured at 25 37°C for 22 hours in the presence of 5% CO<sub>2</sub>. After the medium was removed, the cell surface was washed with a phosphate buffer solution followed by DMEM containing 50 mM Tris-hydrochloride (pH 7.5) (TDMEM). A suspension containing 1  $\mu$ l of the single-stranded phage suspension, 0.6 ml of the 30 DMEM medium and 3  $\mu$ l of TRANSFECTAM™ (IBF) was added to the cells and the cells were cultured at 37°C for 3 hours in the presence of 5% CO<sub>2</sub>. After the sample solution was removed,



the cell surface was washed with TDMEM, 2 ml per well of DMEM containing 10% fetal calf serum was added, and the cells were cultured at 37°C for 2 days in the presence of 5% CO<sub>2</sub>. After the medium was exchanged for a medium containing  
5 [35S]cystine or [35S]methionine, the cells were cultured for one hour. After the medium and the cells were separated each other by centrifugation, proteins in the medium fraction and the cell membrane fraction were subjected to SDS-PAGE.

#### (4) Clone Examples

10 <HP02539> (SEQ ID NOS: 1, 11, and 21)

Determination of the whole base sequence of the cDNA insert of clone HP02539 obtained from cDNA library of human osteosarcoma cell line Saos-2 revealed the structure consisting of a 188-bp 5'-untranslated region, a 1944-bp ORF,  
15 and a 2353-bp 3'-untranslated region. The ORF encodes a protein consisting of 647 amino acid residues and there existed a putative secretory signal at the N-terminus and six putative transmembrane domains at the C-terminus. Figure 1 depicts the hydrophobicity/hydrophilicity profile,  
20 obtained by the Kyte-Doolittle method, of the present protein.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the mouse frizzled-1 (GenBank  
25 Accession No. AF054623). Table 2 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the mouse frizzled-1 (MM). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the  
30 present invention, and an amino acid residue similar to that of the prot in of the present invention, respectively. The both proteins shared a homology of 90.4% in the entire

region.

Table 2

	HP	MAEEEAPKKSRAAGGGASWELCAGALSARLTEEGSGDAGGRRRPPVDPRRRLARQLLLLLLW
		****.***.***** * * ****.***.* . * * . * . . . . ****.***** * . *****
5	MM	MAEEAAPSESRAA-GRLSLELCAEALPGRREEVGHEDTASHRRPRADPRRWASGLLLLLLW
	HP	LLEAPLLLGVRAQAAGQGPGQGPQPPPPQQQSGQQYNGERGISVPDHGYCQPIS
		***** ** .*****.*****.*****.*****.*****
	MM	LLEAPLLLGVRAQAA---GQVSGPGQOAPPPQPPQSGQQYNGERGISIPDHGYCQPIS
	HP	IPLCTDIAYNQTIMPNNLGHNTQEDAGLEVHQFYPLVKVQCSAELKFFLCSMYAPVCTVL
10		*****.*****.*****.*****.*****.*****.*****.*****.*****.*****
	MM	IPLCTDMAYNQTIMPNNLGHNTQEDAGLEVHQFYPLVKVQCSAELKFFLCSMYAPVCTVL
	HP	EQALPPCRSLCERARQGCEALMNKFGFQWPDTLKCEKFPVHGAGELCVGQNTSDKGTPTP
		*****.*****.*****.*****.*****.*****.*****.*****.*****.*****
	MM	EQALPPCRSLCERARQGCEALMNKFGFQWPDTLKCEKFPVHGAGELCVGQNTSDKGTPTP
15	HP	SLLPEFWTSNPQHGGGGHRRGGFPGGAGASERKGFSCPRALKVPSYLYNHFLGEKDCGAPC
		***** *****.***.*****.*****.*****.*****.*****.*****.*****
	MM	SLLPEFWTSNGHGGGGYRGYPGGAGTVERGKGFSCPRALRVPSYLYNHFLGEKDCGAPC
	HP	EPTKVYGLMYFGPEELRFSRTWIGIWSVLCCASTLFTVLTYLVDMMRRFSYPERPIIFLSG
		*****.*****.*****.*****.*****.*****.*****.*****.*****.*****
20	MM	EPTKVYGLMYFGPEELRFSRTWIGIWSVLCCASTLFTVLTYLVDMPRFSYPERPIISLSG
	HP	CYTAVAVAYIAGFLEDRVVCNDKFAEDGARTVAQGTKEGCTILFMMLYFFSMASSIWW
		*****.*****.*****.*****.*****.*****.*****.*****.*****.*****
	MM	CYTAVAVAYIAGFLEDRVVCNDKFAEDGARTVAQGTNKEGCTILFMMLYFFSMASSIWW
	HP	VILSLTWFLAAGMKWGHEAIEANSQYFHAAWAVPAIKTITILALQVGDGDLVSGVCFVG
25		*****.*****.*****.*****.*****.*****.*****.*****.*****.*
	MM	VILSLTWFLAAGMKWGHEAIEANSQYFHAAWAVPAIKTITILALQVGDGDLVSGVCFVG
	HP	LNNVDALRGFVLAPLFVYLFIGTSFLLAGFVSLFRIRTIMKHDGKTKEKLEKLMVRIGVF
		*****.*****.*****.*****.*****.*****.*****.*****.*****.*****
	MM	LNNVDALRGFVLAPLFVYLFIGTSFLLAGFVSLFRIRTIMKHDGKTKEKLEKLMVRIGVF
30	HP	SVLYTVPATIVIACYFYEQAFRDQERSWVAQCKSYAIPCPHLQAGGGAPPHPPMSPDF
		*****.*****.*****.*****.*****.*****.*****.*****.*****.*****
	MM	SVLYTVPATIVIACYFYEQAFRDQERSWVAQCKSYAIPCPHLQAGGGVPPHPPMSPDF
	HP	TVFMIKYLMTLIVGITSGFWIWSGKTLNSWRKFYTRLTNSKQGETTV
		***** *****
35	MM	TVFMIKYLMTLIVGITSGFWIWSGKTLNSWRKFYTRLTNSKQGETTV

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA010020) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

10

<HP02770> (SEQ ID NOS: 2, 12, and 22)

Determination of the whole base sequence of the cDNA insert of clone HP02770 obtained from cDNA library of human fibrosarcoma cell line HT-1080 revealed the structure consisting of a 252-bp 5'-untranslated region, a 1053-bp ORF, and a 204-bp 3'-untranslated region. The ORF encodes a protein consisting of 350 amino acid residues and there existed two putative transmembrane domains. Figure 2 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 42 kDa that was somewhat larger than the molecular weight of 38,274 predicted from the ORF.

15

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the human RING zinc finger protein (GenBank Accession No. AF037204). Table 3 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the human RING zinc finger protein (ZN). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue

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similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 56.0% in the entire region.

5

Table 3

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	HP	MHPAAFPLPVVVA AVLWG AAPTRGLIRATSDHNASMD FADLPALFGATLS
		.*** *.***** ** *
	ZN	MLLSIGMLMLSATQVYTILTVQLFAFLNLLPVEADILAYNFENASQTFDDLPARFGYRLP
10	HP	QEG LQGFLVEAHPDNACSPIAPPPAPVNGSVFIALLRRFDCNFDLKV LNAQKAGYGAAV
		.***.***.....*.***.***.*** .....*.***.*****.*****.*** **.
	ZN	AEGLKGFLINSKPENACEPIVPPPVKDNSSGTFIVLIRRLDCNFDIKVLNAQRAGYKAAI
	HP	VHNVNSNELLNMVWNSEEIQQIWIWIPSVFIGERSSEYLRLALFVYEKGARVILLVPDNTFPL
		****.***** * . * . . * *****.*** * . * .*****.....* .***
15	ZN	VHNVDSDDLISMGSN DIEVLKKIDIPSVFIGESSANSLKDEFTYEKG GHLILVPEFSLPL
	HP	GYLIPFTGIVGLLV LAMGAVMIARCIQHRKRLQRNRLTKEQLKQIPTHDYQKGDQYDVC
		.***** ***. . . . **..*.*.* ***** *.***.....* .***.*****
	ZN	EYYLIPFLIIVGICLILIVIFMITKFVQDRHRARRNRLRKDQLKKLPVHKFKKGDEYDVC
	HP	AICLDEYEDGDKLRVLP CAHAYHSRCVDPWLTQTRKTCPICKQPVHRGPGDED-QEEETQ
20		*****.*****.***.*****.*****.***.*****.*** * ..***.*** .....
	ZN	AICLDEYEDGDKLRILPCSHAYHCKCVD PWLTKTKKTCPVCKQKVVP SQGDSDDTDSSQ
	HP	GQEEGDEGEPRDHPASERTPLLGSPTLPTSFGSLAPAPLVFPGPSTDPPLSPSPSPVIL
		...* .* .* .*
	ZN	EENEVTEHTPLLRLASVSAQSFGALSESRS HQNMTESDYEDDNE DTDSSDAENEINE
25	HP	V
	ZN	HDVVVQLQPNGERDYN IANTV

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Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA434312) among ESTs. However, since they are partial sequences, it can not be judged whether or

not they encode the same protein as the protein of the present invention.

<HP02869> (SEQ ID NOS: 3, 13, and 23)

5       Determination of the whole base sequence of the cDNA  
insert of clone HP02869 obtained from cDNA library of human  
epidermoid carcinoma cell line KB revealed the structure  
consisting of a 229-bp 5'-untranslated region, a 621-bp ORF,  
and a 2209-bp 3'-untranslated region. The ORF encodes a  
10   protein consisting of 206 amino acid residues and there  
existed two putative transmembrane domains. Figure 3 depicts  
the hydrophobicity/hydrophilicity profile, obtained by the  
Kyte-Doolittle method, of the present protein. In vitro  
translation resulted in formation of a translation product  
15   of 22 kDa that was almost identical with the molecular  
weight of 22,367 predicted from the ORF.

Furthermore, the search of the GenBank using the base  
sequences of the present cDNA has revealed the registration  
of sequences that shared a homology of 90% or more (for  
20   example, Accession No. AA278247) among ESTs. However, since  
they are partial sequences, it can not be judged whether or  
not they encode the same protein as the protein of the  
present invention.

25   <HP02956> (SEQ ID NOS: 4, 14, and 24)

Determination of the whole base sequence of the cDNA  
insert of clone HP02956 obtained from cDNA library of human  
epidermoid carcinoma cell line KB revealed the structure  
consisting of a 68-bp 5'-untranslated region, a 642-bp ORF,  
30   and a 1657-bp 3'-untranslated region. The ORF encodes a  
protein consisting of 213 amino acid residues and there  
existed three putative transmembrane domains. Figure 4

depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 22 kDa that was almost identical with the  
5 molecular weight of 23,902 predicted from the ORF. When expressed in COS7 cells, an expression product of about 20 kDa was observed in the membrane fraction.

The search of the protein data base using the amino acid sequence of the present protein revealed that the  
10 protein was similar to the human tetraspan NET-4 (GenBank Accession No. AF065389). Table 4 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the human tetraspan NET-4 (TS). Therein, the marks of -, \*, and . represent a gap, an amino  
15 acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 58.8% in the C-terminal region of 119 amino acid residues.

Table 4

	HP	MHY
5	TS MSGKHYKGPEVSCCIKYFIFGFNVIFWFLGITFLGIGLWAWNEKGVLSNISSITDLGGFD HP YRYRNAKVSCWYKYLFSYNIIFWLAGVVFLGVGLWAWSEKGVLSDLTKVTRMHGIDPVV	
	TS PVWFLVVGVMFILGFAGCIGALRENTFLLKFFSVFLGIIFLELTAGVLAFVFKDWIK HP LVLVGVVMFTLGFAGCVGALRENICLLNFNQCCGAYGPEDWDLNVYFNCSGASYSREKC	
10	TS DQLYFFINNNIRAYRDDIDLQNLIDFTQEYWQCCGAFGADDWNLNIYFNCTDSNASRERC HP GVPFSCCVPDPAQKVNTQCGYDVRIQLKSKWDESIFTKGCIALESWLPRNIYIVAGVF *****. ****.*.*****.* . . . . *.*****.*.***. *. *****. TS GVPFSCCTKDP AEDVINTQCGYDARQKPEVDQQIYIYTKGCVPFQEKWLQDNLTIVAGIF HP IAISLLQIFGIFLARTLISDIEAVKAGHHF *.*.***** **.*.*****.*. TS IGIALLOIFGICLAQNLVSDIEAVRASW	
<hr/>		
20	Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. T05279) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.	
25		
30	<HP02962> (SEQ ID NOS: 5, 15, and 25) Determination of the whole base sequence of the cDNA insert of clone HP02962 obtained from cDNA library of human epidermoid carcinoma cell line KB revealed the structure consisting of a 19-bp 5'-untranslated region, a 1788-bp ORF, and a 548-bp 3'-untranslated region. The ORF encodes a	



protein consisting of 595 amino acid residues and there existed a putative secretory signal at the N-terminus. Figure 5 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 70 kDa that was somewhat larger than the molecular weight of 67,549 predicted from the ORF. In this case, the addition of a microsome led to the formation of a product of 85 kDa to which sugar chains are presumably attached. Application of the (-3,-1) rule, a method for predicting the cleavage site of the secretory signal sequence, allows to expect that the mature protein starts from alanine at position 23. In addition, there exist in the amino acid sequence of this protein four sites at which N-glycosylation may occur (Asn-Thr-Thr at position 75, Asn-Gln-Thr at position 153, Asn-Tyr-Thr at position 237 and Asn-Ser-Ser at position 360).

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the human hypothetical protein KIAA0584 (GenBank Accession No. AB011156). Table 5 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the human hypothetical protein KIAA0584 (KI). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 52.9% in the entire region.

[illegible]

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA358896) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

10

<HP03014> (SEQ ID NOS: 6, 16, and 26)

Determination of the whole base sequence of the cDNA insert of clone HP03014 obtained from cDNA library of human liver revealed the structure consisting of a 26-bp 5'-untranslated region, a 795-bp ORF, and a 203-bp 3'-untranslated region. The ORF encodes a protein consisting of 264 amino acid residues and there existed one putative transmembrane domain. Figure 6 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 31 kDa that was somewhat larger than the molecular weight of 28,471 predicted from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the mouse WW domain-binding protein 1 (GenBank Accession No. U40825). Table 6 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the mouse WW domain-binding protein 1 (MM). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue

30

5

Table 6

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HP                                     MVASAKMGRAGTMAVAEELR
**
MM MARASSRNSSEEAWGSLQAPQQQSPAASSLEGAIWRRAGTQTRALDTILYHPQQSHLLR
10 HP ELCPGVNNQPYLCESGHCCGETGCCTYYYELWWFWLLWTVLILFSCCCAFRHRRAKLRLQ
*****.*****.*****
MM ELCPGVNTQPYLCEGHCCGETGCCTYYYELWWFWLLWTVLILFSCCCAFRHRRAKLRLQ
HP QQRQREINLLAYHGACHGAGPFTGSLLDLRFLSTFKPPAYEDVVRHPGT PPPPYTVAP
***** *****.*.*****.*****.*
15 MM QQRQREINLLAYHGACHGAGPVPTGSLLDLRLLSAFKPPAYEDVVHHPGT PPPPYTVGP
HP GRPLTASSEQTCCSSSSCPAHFEGTNVEGVSSHQSAPPHQEGEPGAGVTPASTPPSCRY
* * *.*** * **.*.*.*****.* ** ***** *.*.*****
MM GYPWTTSECTRCSSESSCSAHLGENTVEGVSSQQSALPHQEGERAGLSPVHIPPCRY
HP RRLTGDSGIELCPCPASGEPEVKVRVSATLPDLEDYSPCALPPESVPQIFPMGLSSSE
20 *****.*.****.*.*.*.*****.*****.*.*.****.*
MM RRLTGDSGIELCPCPDSEGEPLKEARASASQPDLEDHSPCALPPDSVSVQVPPMGLASSC
HP GDIP
*
MM GTSHK

```

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. W24575) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP10608> (SEQ ID NOS: 7, 17, and 27)

Determination of the whole base sequence of the cDNA insert of clone HP10608 obtained from cDNA library of human osteosarcoma cell line Saos-2 revealed the structure consisting of a 23-bp 5'-untranslated region, a 1032-bp ORF, and a 182-bp 3'-untranslated region. The ORF encodes a protein consisting of 343 amino acid residues and there existed five putative transmembrane domains. Figure 7 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 37 kDa that was somewhat smaller than the molecular weight of 40,584 predicted from the ORF. When expressed in COS7 cells, an expression product of about 36 kDa was observed in the membrane fraction.

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. T35406) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP10609> (SEQ ID NOS: 8, 18, and 28)

Determination of the whole base sequence of the cDNA insert of clone HP10609 obtained from cDNA library of the human epidermoid carcinoma cell line KB revealed the structure consisting of a 38-bp 5'-untranslated region, a 735-bp ORF, and a 559-bp 3'-untranslated region. The ORF encodes a protein consisting of 244 amino acid residues and there existed one putative transmembrane domain at the N-terminus. Figure 8 depicts the hydrophobicity/hydrophilicity

profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 27 kDa that was almost identical with the molecular weight of 27,756 predicted from the ORF.

5 When expressed in COS7 cells, an expression product of about 26 kDa was observed in the membrane fraction.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the Mycobacterium tuberculosis hypothetical protein Rv1147 (GenBank Accession No. Z95584).

10 Table 7 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the Mycobacterium tuberculosis hypothetical protein Rv1147 (MT). Therein, the marks of -, \*, and . represent a gap, an amino

15 acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 31.7% in the entire region.

Table 7

20 Furthermore, the search of the GenBank using the base  
sequences of the present cDNA has revealed the registration  
of sequences that shared a homology of 90% or more (for  
example, Accession No. T60981) among ESTs. However, since  
they are partial sequences, it can not be judged whether or  
25 not they encode the same protein as the protein of the  
present invention.

<HP10611> (SEQ ID NOS: 9, 19, and 29)

Determination of the whole base sequence of the cDNA  
30 insert of clone HP10611 obtained from cDNA library of the  
human epidermoid carcinoma cell line KB revealed the  
structure consisting of a 37-bp 5'-untranslated region, a  
912-bp ORF, and a 983-bp 3'-untranslated region. The ORF

encodes a protein consisting of 303 amino acid residues and there existed a putative secretory signal at the N-terminus. Figure 9 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 31 kDa that was somewhat smaller than the molecular weight of 33,856 predicted from the ORF. In this case, the addition of a microsome led to the formation of a product of 36 kDa. Application of the (-3,-1) rule, a method for predicting the cleavage site of the secretory signal sequence, allows to expect that the mature protein starts from leucine at position 34. When expressed in COS7 cells, an expression product of about 35 kDa was observed in the membrane fraction.

The search of the protein data base using the amino acid sequence of the present protein revealed that the 218 amino acid residues at the C-terminus of the protein matched with the amino acid sequence of human glucosidase II (SWISS-PROT Accession No. Q06003). However, no similarity was observed at the N-terminal portion.

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. H14054) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP10617> (SEQ ID NOS: 10, 20, and 30)

Determination of the whole base sequence of the cDNA insert of clone HP10617 obtained from cDNA library of the human fibrosarcoma cell line HT-1080 revealed the structure



consisting of a 72-bp 5'-untranslated region, a 483-bp ORF, and a 569-bp 3'-untranslated region. The ORF encodes a protein consisting of 160 amino acid residues and there existed four putative transmembrane domains. Figure 10 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of high molecular weight. When expressed in COS7 cells, an expression product of about 17 kDa was observed in the membrane fraction.

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. H67672) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP02837> (SEQ ID NOS: 31, 41, and 51)

Determination of the whole base sequence of the cDNA insert of clone HP02837 obtained from cDNA library of human fibrosarcoma cell line HT-1080 revealed the structure consisting of a 44-bp 5'-untranslated region, a 4338-bp ORF, and a 91-bp 3'-untranslated region. The ORF encodes a protein consisting of 1445 amino acid residues and there existed a putative secretory signal at the N-terminus. Figure 11 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 150 kDa that was almost identical with the molecular weight of 161,657 predicted from the ORF. Application of the (-3,-1) rule, a method for predicting the

cleavage site of the secretory signal sequence, allows to expect that the mature protein starts from valine at position 22. In addition, there exist in the amino acid sequence of this protein 18 sites at which N-glycosylation  
5 may occur.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the human  $\alpha$ -2 macroglobulin (SWISS-PROT Accession No. P01023). Table 8 shows the comparison  
10 between amino acid sequences of the human protein of the present invention (HP) and the human  $\alpha$ -2 macroglobulin (MG). Therein, the marks of - and \* represent a gap and an amino acid residue identical with that of the protein of the present invention, respectively. The both proteins shared a  
15 homology of 29.5% in the entire region.

Table 8

	HP	MOGPPLL--TAAHLLCVCTAALA-VAGPRFLVTAPGIIRPGGNVTIGVELLEHCPSQVT
		*    **            ***       * *    *    *            *    **       **
5	MG	MGKKNLLHPSLVLLLLVLLPTDASVSGKPQYMLVP-SLLHTETTEKGCVLLSYLNETVT
	HP	VKAELLKTASN-LTVSVLEAE-GVFEKGSFKTLTLPSPILNSADEIYELRVTGRQTQDEIL
		* * *       *            ****    *            *       *            * * * *
	MG	VSASLESVRGNRSLFTDLEAENDVLHCVAF---AVPKSSSNEEVMFLTQVKGPTQ---E
	HP	FSNSTRLSFETKRISVFIQTDKALYKPKQEVKFRIVTLFSDFKPYKTSNLIL--IKDPKS
10		*    *                    ** ****    *** *    **** *            * *       *    *    ***
	MG	FKKRITVMVKNEDSLVFVQTDKSIYKPGQTVKFRVVSMDENFHP-LNELIPLVYIQDPKG
	HP	NLIQQWLSQQSDLGVISKTFQLSSHPI LGDWSIQVQ-VNDQTYQQSFQVSEYVLPKFEVT
		* * * * *       *            * * * *    *            **                    * * * *
	MG	NRIAQQWQSFQLEGGKQFSFPLSSEPFQGSYKVVVQKKSQGRTEHPFTVEEFVLPKFEVQ
15	HP	LQTPLYCSMNSKHLNGTITAKYTYGKPVKGDTV----LTFLPLSFWGKKKNITKTFKING
		*                    *            * * * * *    *                    *       *
	MG	VTVPKIITILEEEMNVSVCGLYTYGKVPVGHVTVSICRKYS DASDCHGEDSQAFCFKFSG
	HP	SANFSFNDEEMKNVMDSSNGLSEY-LDLSFPGPVEILTTVTESVTG----ISRNVTNVF
		*                                    **       *                    * *            *
20	MG	QLNSHGCFYQQVKTQVFQKLRKEYEMKLHTEAQIQEETVVELTGRQSSEITRTITKLSF
	HP	FK--QHDYIIIEFFDYTTVLKPSLNFTATVKVTRADGNQLTLEERRNNVITVTQRNYTEY
		*    *            *       *                    **       **                    *       *
	MG	VKVDSHFRQGIPFFGQVRLVDGKGVPIPNKVIFIRGN-----EANYYSNATDEHGLV
	HP	WSGSNSGNQKMEAVQKINYTVPQSGTFKIEFPILEDSSSELQKAYFLGSKSSMAVHSLFK
25		*    *       *                                    *       *       *       *       *
	MG	QFSINTTN-VMGTSLTVRVNYKDRSPCYGYQWVSEEHEEAHTAYLVFSPSKSFVHLEPM
	HP	S--PSKTYIQLKTRDENIKVGSPPFELVVSGNKRLLKELSYMVVSRLQVAVGKQ--NSTMF
		*                    *                    *       *                    *       *            **       *
	MG	SHELPCGHTQTVQAHYILNGGTLGLKLSFYYLIMAKGGIVRTGTHGLLVKQEDMKGHF
30	HP	S-LTPENS-WTPKACVIVYYIEDDGEIISDVLKIPVQLVFNKIKLYWSKVKAEPSEKVS
		*    *       *       *       *                    *       *       *       *       *
	MG	SISIPVKSDIAPVARLLIYAVLPTGDVIGDSAKYDVENCLANKVDLSFSPSQSLPASHAH
	HP	LRISVT-QPDSIVGIVAVDKSVNLMNASNDITMENVVHEL-ELYNTG-----
		**    **       *       *                    ***    *       *       *       *
35	MG	LR--VTAAPQSVCALRAVDQSVLLMKPDAELSASSVYNLLPEKDLTGFPGLNDQDDEDC

HP -----YYLGMFMNSFAVFQE-CGLWVLT DANL---TKDYIDGVYD NAEYAERFMEENEG  
\* \* \* \* \*  
MG INRHNVYINGITYTPVSSTNEKDMYSFLEDMGLKAF TNSKIRKPKMCPQLQQYEMHGPEG  
HP HIV-----DIHDFSLGSSPH---VRKHFPETWIWLD TNMGSR IYQEF ETV PDSI  
5 \* \*\* \* \* \* \* \* \* \* \* \*  
MG LRVGFYESDVMGRGHARLVHVEEPHTETVRKYFPETWIWDLVVVNSAGVAE VGTVPDTI  
HP TSWVATGFVISED LGLGLTTTPVELQAFQPFIFLNL PYSVIRGE EFALEITIFNYLKDA  
\* \* \* \* \* \* \* \* \* \* \* \* \* \* \*  
MG TEWKAGAFCLSEDAGLGISST-ASLRAFQPFVELTMPYSVIRGEAFTLKATV LNYLPKC  
10 HP TEVKVIEKSDKFDILMTSSE-----INATGHQ-QTLLVPSEDGATVLFPIRPHL--GE  
\* \* \* \* \* \* \* \* \* \* \* \* \* \* \*  
MG IRVSVQLEASPAFLAVPVEKEQAPHICANGRQTVSWAVTPKSLGNVNFTVSAEAL ESQE  
HP IPITVTALSP--TASDAITQMILVKAEGIEKSYSQSILLDLTDNRLQSTL KLSFSFPPN  
\* \* \* \* \* \* \* \* \* \* \* \* \* \* \*  
15 MG LCGTEVPSVPEHGRKDTVIKPLLVEPEGLEKETTFNSLL---CPSGGEVSEELSLKLPPN  
HP TVTGSE RVQITAIGDVLGPSINGLASLIRMPYGCGEQNMINFAPNIYVLDYLT KKKQLTD  
\* \* \* \* \* \* \* \* \* \* \* \* \* \* \*  
MG VVEESARASVSVLGDILGSAMQNTQNLLOMPYGCGEQNMVLFAPNIYVLDY LNETQQLTP  
HP NLKEKALSFMROGYQRELLYQREDGSFSAFG--NYDPSGSTWLSAFVLR CFLEADPYIDI  
20 \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*  
MG EVKSKAIGYLN TGYQRQLNYKHYDGSYSTFGERYGRNQNTWLTAFVLKTF AQARAYIFI  
HP DQNVLHRTYTWLKGHQKSNGEFWD PGRVIHSELQGGNKSPVTLTAYIVT SLLGYRKYQPN  
\* \* \* \* \* \* \* \* \* \* \* \* \* \* \*  
MG DEAHITQALIWLSQRQKDNGCFRSSGSLNNAIKGGVEDEVTL SAYITIALLEIPLTVTH  
25 HP IDVQESIHFLES-----EFSRGISDNYTLALITYALSSVG-SPKAKEALNMLTWRAEQE  
\* \* \* \* \* \* \* \* \* \* \* \* \* \* \*  
MG PVVRNALFCLES AWKTAQEGDHG-SHVYTKALLAYAFALAGNQDKRKEVLKSLNEEAVKK  
HP GGMQFW-----VSSES KLSDSWQPRSLDIEVAAYALLSHFLQFQ--TSE----GIPIMRW  
\* \* \* \* \* \* \* \* \* \* \* \* \* \* \*  
30 MG DNSVHWERPQPKAPVGHFYEPQAPSAE VEMTSYVLLAYLTAQPAPTS EDLTSATNIVKW  
HP LSRQRNSLGGFASTQDTTVALKALSEFAALMNTERTNIQVTVTG PSS-PSPVKFLIDTHN  
\* \* \* \* \* \* \* \* \* \* \* \* \* \* \*  
MG ITKQONAQGGFSSTQDTVVALHALSKYGAATFT-RTGKAAQVTIQSSGTFSSKFQVDNNN  
HP RLLQLTAELAVVQPTAVNISANGFGFAI CQLNVVYNVKASGSSRRRRRSIQNQEAFDL DVA  
35 \*\*\*\*\* \* \* \* \* \* \* \* \*

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MG RLLLQQVSL-PELPGEYSMKVTGEGCVYLQTSCLKYN-----ILPEKEEFPFALGVQTLPTQT
HP VKENK-DDLNHVDLNVCTSFSGPGRSGMALMEVNLLSGFMVPSEAISSLSETVKKVEYDHG
      * *      * *      *      * * *      *      * *      * *      *
MG CDEPKAHTSFQISLSVSYTGS-RSASNMAIVDKMVSGF-----IPLKPTVKMLE-----
5 HP KLNLYLDSVNETQFCVNIPAVRNFKVSNQDASVSIVDYEPRRQAVRSYNSEVKLSSCD
      * *      *      * * *      *      *      * *      *
MG ----RSNHVSRTEVSSNHVLIYLDKVSNTLSLFFTVLQDVP----VR-----D
HP LCSDVQGCRPCEDGASGSHHSSVIFIFCFKLLYFMELWL
      *      *      * * *
10 MG L---KPAIVKVYDYYETDEFAIAEYNAPCSKDL---GNA

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Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. W33075) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

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<HP02991> (SEQ ID NOS: 32, 42, and 52)

Determination of the whole base sequence of the cDNA insert of clone HP02991 obtained from cDNA library of human epidermoid carcinoma cell line KB revealed the structure consisting of a 81-bp 5'-untranslated region, a 1749-bp ORF, and a 800-bp 3'-untranslated region. The ORF encodes a protein consisting of 582 amino acid residues and there existed a putative secretory signal at the N-terminus. Figure 12 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 66 kDa that was somewhat larger than the molecular weight of 64,244 predicted from the ORF. In

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this case, the addition of a microsome led to the formation of a product of 78 kDa to which sugar chains are presumably attached. Application of the (-3,-1) rule, a method for predicting the cleavage site of the secretory signal sequence, allows to expect that the mature protein starts from valine at position 27. In addition, there exist in the amino acid sequence of this protein seven sites at which N-glycosylation may occur (Asn-Gly-Thr at position 70, Asn-Gly-Thr at position 182, Asn-Gly-Ser at position 294, Asn-His-Thr at position 310, Asn-Gly-Thr at position 352, Asn-Glu-Thr at position 393 and Asn-Cys-Ser at position 407).

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the mouse FKBP65-binding protein (GenBank Accession No. L07063). Table 9 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the mouse FKBP65-binding protein (MM). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 88.8% in the entire region.

Table 9

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	HP	MFPAGPPSHSLLRLPLLQLLLLVQAVGRGLGRASPAGGPLEDVVIERYHIPRACPREVQ
		** .*.***. *...*.***** .*...*****.*****.*****
5	MM	MFLVGSSSHTLHRVRILPLLLL-LQTLERGLGRASPAGAPLEDVVIERYHIPRACPREVQ
	HP	MGDFVRYHYNGTFEDGKKFDSSYDRNTLVAIVVGVRGLITGMDRGLMGMCVNERRRLIVP
		*****.*****.*****.*****.*****.*****.*****.*****
	MM	MGDFVRYHYNGTFEDGKKFDSSYDRSTLVAIVVGVRGLITGMDRGLMGMCVNERRRLIVP
	HP	PHLGYGSIGLAGLIPPDATLYFDVLLDVWNKEDTVQVSTLLRPPHCPRMVQDGFVRYH
10		*****.*****.*****.*****.*****.*****.*****.*****
	MM	PHLGYGSIGVAGLIPPDATLYFDVLLDVWNKADTVQSTILLRPPYCPRMVQNSDFVRYH
	HP	YNGTLLDGTSTFDTSYSKGGTYDTYVGSGLIKGMDQGLLGMCPGERRKIIIPFFLAYGEK
		*****.***.***.*****.*****.*****.*****.*****
	MM	YNGTLLDGTGFDNSYSRGGTYDTYIGSGWLIKGMDQGLLGMCPGERRKIIIPFFLAYGEK
15	HP	GYGTVIPPQASLVFVLLIDVHNPKDAVQLETLELPQGCVRRAVAGDFMRYHYNGSLMDG
		*****.***.*****.*****.*****.*****.*****.*****
	MM	GYGTVIPPQASLVFYVLLLDVHNPKDQTVQLETLELPQGCVRRAVAGDFMRYHYNGSLMDG
	HP	TLFDSSYSRNHTYNTYIGQGYIIPGMDQGLQACMGERRRITIPPHLAYGENGTGDKIPG
		*****.*****.*****.*****.*****.*****.*****.*****
20	MM	TLFDSSYSRNHTYNTYVGQGYIIPGMDQGLQACIGERRRITVPPHLAYGENGTGDKIPG
	HP	SAVLIFNVHVIDFHNPDVVEIRTLRPSSETCNETTKLGDFVRYHYNCSSLDDGTQLFTSH
		*****.*****.***.***.*****.***.*****.***.***.*****.***.***
	MM	SAVLIFDVHVIDFHNPSDFVEIKTLRPPENCNETSKIGDFIRYHYNCSSLDDGTQLFTSSH
	HP	DYGAPQEATLGANKVIEGLDTGLQGMCGERRQLIVPPHLAGESGARGVPGSAVLLFEV
25		***.*****.*****.*****.*****.*****.*****.*****
	MM	DYEAPQEITLGANKVIEGLDRGLQGMCGERRQLIVPPHLAGENGARGVPGSAVLLFEV
	HP	ELVSREDGLPTGYLFVWHKDPANLFDMDLNKDGEVPPEEFSTFIKAQVSEGKRLMPG
		*****.***.***.*****.*****.*****.*****.*****
	MM	ELVSREDGLPTGYLFVWYQDPSTSLFEDMDLNKDGEVPPEEFSSFIKAQVNEGKRLMPG
30	HP	QDPEKTIGDMFQNQDRNQDGKITVDELKLKSDDEDEERVHEEL
		***.***.*****.*****.*****.*****.*****.*****
	MM	QDPDKTISDMFQNQDRNQDGKITAEELKLKSDDEDQERVHEEL

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sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA308536) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP03063> (SEQ ID NOS: 33, 43, and 53)

Determination of the whole base sequence of the cDNA insert of clone HP03063 obtained from cDNA library of human fibrosarcoma cell line HT-1080 revealed the structure consisting of a 88-bp 5'-untranslated region, a 1233-bp ORF, and a 151-bp 3'-untranslated region. The ORF encodes a protein consisting of 410 amino acid residues and there existed a putative transmembrane domain at the N-terminus. Figure 13 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 46 kDa that was almost identical with the molecular weight of 45,786 predicted from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the mouse AUP1 (GenBank Accession No. U41736). Table 10 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the mouse AUP1 (MM). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 90.2% in the entire region.



Table 10

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HP MELPSGPGPERLFDShRLPGDCFLLLVLLLYAPVGFCLLVLRFLGLHVFVLSALPDSV
  ** *..*****.* ****.******.******.******
5 MM MEPPAPGPERLFDShRLPSDGFLLLALLLYAPVGLCLLVLRFLGLHVFVLSALPDSV
HP LRRFVVRTMCAVLGLVARQEDSGLRDHSVRVLISNHVTPFDHNIVNLLTTCSTPLLNSPP
  *****.******.******.******
MM LRRFVVRTMCAVLGLVARQEDSGLRDHRVRVLISNHVTPFDHNIVNLLTTCSTPLLNSPP
HP SFVCWSRGFMEMNGRGELVESLKRFCASTRLPPTPLLLFPEEEATNGREGLLRFSSWPFS
10 *****.* *****.******.******
MM SFVCWSRGFMEMDRRVELVESLKKFCASTRLPPTPLLLFPEEEATNGREGLLRFSSWPFS
HP IQDVVQPLTLQVQRPLVSVTVSDASWVSELLWSLFVPFTVYQVRWLHPVHRQLGEANEFF
  *****.*..*****.*
MM IQDVVQPLTLQVQRPLVSVTVSDASWVSELLWSLFVPFTVYQVRWLHPVHRQLGEANEFF
15 HP ALRVQQLVAKELGQTGTRLTPADKAHEMKRQRHPRLRPQSAQSSFPPSPGSPDVQLATL
  *****.******.******.******
MM ALRVQQLVAKELGQIGTRLTPADKAHEMKRQRHPRLRPQSVQSSFPSPSPSSDVQLTTL
HP AQRVKEVLPHVPLGVIQRDLAKTGCVDLTITNLLEGAVAFMPEDITKGTQSLPTASAKF
  *.*****.******.******.*.* ** *..*
20 MM AHRVKEVLPHVPLNVIQRDLARTGCVDLTITNLLEGAVAFMPEDVTEGSQSPPAPSAPKF
HP PSSGPVTPQPTALTFAKSSWARQESLQERKQALYFYARRRFTERRAQEAD
  ****.******.******.*
MM PSSGLATPQPTALTFAKSSWARQESLQERKQALYFYARRRFRERQAQAE

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Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA131932) among ESTs. However, since

30 they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP03091> (SEQ ID NOS: 34, 44, and 54)

Determination of the whole base sequence of the cDNA insert of clone HP03091 obtained from cDNA library of human liver revealed the structure consisting of a 16-bp 5'-untranslated region, a 1452-bp ORF, and a 184-bp 3'-untranslated region. The ORF encodes a protein consisting of 483 amino acid residues and there existed a putative secretory signal at the N-terminus. Figure 14 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. Application of the (-3,-1) rule, a method for predicting the cleavage site of the secretory signal sequence, allows to expect that the mature protein starts from leucine at position 34.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the human OS-9 protein (SWISS-PROT Accession No. Q13438). Table 11 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the human OS-9 protein (OS). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 27.8% in the N-terminal region of 281 amino acid residues. The positions of eight cysteines were conserved between the two proteins.

Table 11

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HP MEEGGGVRSLVPGGPVLLLVLCGLLEASGGGRALPQLSDDIPFRVNWPGTEFSLPTTGVV
      . * . . .   * * . *   * *   . . .   . .   * .   . . .   . . * * . *
5  OS      MAEETLLSSLLGLLLLL-GLLLPASLTGGVGSINLEELSEMRYGIEILPLPVMGGQ
HP YKEDNYVIMTTAHKEKYKCILP----LVTSGDEEEEEKDYKGPNPRELLEPLFKQSSCSYR
      . . . .   * * . . .   . * . . *   * *   . .   * * * .   . * . * .   * * * . *   . . . . *   .
OS SQSSDVIVVSSKYKQRYECRLPAGAIHFQREEREETPAYQGPGIPELLSPM-RDAPCLLK
HP IESYWTYEVCHGKHIRQYHEEKETGQKINIHEYVLGNMLAKNLLFEKEREAEKEKSNEI
10  . . . . * * *   * . * . * . * *   *   . . .   *   . .   * * *   . . . .   . . * .
OS TKDWWTYEFCYGRHIQQYHME-DSEIKGEV--LYLG-----YYQSAFD-----WDDDET
HP PTKNIEGQMTPIYPVGMGNGTPCSLQNRPRSSTVMYIC--HPESKHEILSVAEVTTC
      . .   .   . . . * . .   * * .   * . *   . * * * . . . *   .   .   *   . *   * * .   . *
OS AKASKQHRLKRYHSQTYGNGSKCDL-NGRPRAEVRFLCDEGAGISGDYIDRVDEPLSCS
15  HP YEVVILTPLLCSHPKYRFRASPV-NDIFCQ-SLEPGSPFKPLTLRQLEQQEEILRVPFRRN
      *   . *   * *   * * . * *   *   . * . .   . * . *   * *   .   . . .   . * *   .   .
OS YVLTIRTIRLCPHPLLPPPSAAPAILCHPSLOPEEYMAVYVORROADSKOYGDKIIIELO

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20 Furthermore, the search of the GenBank using the base  
sequences of the present cDNA has revealed the registration  
of sequences that shared a homology of 90% or more (for  
example, Accession No. AA313678) among ESTs. However, since  
they are partial sequences, it can not be judged whether or  
25 not they encode the same protein as the protein of the  
present invention.

<HP03092> (SEQ ID NOS: 35, 45, and 55)

Determination of the whole base sequence of the cDNA  
30 insert of clone HP03092 obtained from cDNA library of human  
liver revealed the structure consisting of a 19-bp 5'-  
untranslated region, a 1824-bp ORF, and a 269-bp 3'-  
untranslated region. The ORF encodes a protein consisting of

607 amino acid residues and there existed at least six putative transmembrane domains. Figure 15 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro  
5 translation resulted in formation of a translation product of high molecular weight.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the rat liver-specific transport  
10 protein (GenBank Accession No. L27651). Table 12 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the rat liver-specific transport protein (RN). Therein, the marks of - and \*  
15 represent a gap and an amino acid residue identical with that of the protein of the present invention, respectively. The both proteins shared a homology of 70.0% in the entire region.

Table 12

```

HP MGFEELEQVGGFGPFQLRNVALLALPRVLLPLHFLPLIFLAAPPAHRCALPGAPANFSH
    **** *  **** *  **** *  **** *  **** *  **** *  **** *  **** *
5  RN MGFEDLLDKVGGFGPFQLRNVLMLALPRMLLPMHFLPLPVFMAAVPAHHCALPGAPANLSH
HP QDVWLEAHLPREPDGTLSSCLRFAYPQALPNTTLGEERQSRGELEDEPATVPCSQGWEYD
    **  **** *  **** *  **** *  **** *  **** *  **** *  **** *
RN QDLWLEAHLPRETDGSFSSCLRFAYPQTVPNVTLGTEVSNSGEPEGEPLTVPCSQGWEYD
HP HSEFSSTIATESQVGIYIIHLEVECRWRQSPWEAAGRGLPWEEAEAAGLGRDKVSYSPSW
10  **** *
RN RSEFSSTIAT-----
HP RESLGGLLSGMEWDLVCEQKGLNRAASTFFAGVLVGAVAFGYLSDRFGRRRLLLVAYVS
    ***** *  ***  ** *  *****  *****
RN -----EWDLVCQQRGLNKITSTCFFIGVLVGAVVGYLSDRFGRRRLLLVAYVS
15  HP TLVLGLASAASVSVMFAITRTLTSALAGFTIIVMPLELEWLDVEHRTVAGVLSSTFWT
    ***** *  **  *  *****  ***** *  **
RN SLVLGLMSAASINYIMFVVTRTLTSALAGFTIIVLPLELEWLDVEHRTVAGVISTVFW
HP GGVMLLALVGYLIRDWRWLLLAATLPCAPGILSLWWVPESARWLLTQGHVKEAHRYLLHC
    ***  *****  *****  **** *  *****  *  **  *** *
20  RN GGVLLLALVGYLIRSWRWLLLAATLPCVPGIISIWWVPESARWLLTQGRVEEAKKYLLSC
HP ARLNGRPVCEDSFSQEA VSKVAAGERVVRPSYDLFRTPLRHISLCCVVWFVGNFSY
    *  ***** *  *  ****  *  **  *****  *****  *****
RN AKLNGRPVGEGLSQAELNNVVTMERALQRPYDLFRTSQRHISLCCMMVWFVGNFSY
HP YGLSLDVSGGLNVYQTQLLFGAVELPSKLLVYLSVRVYAGRRLTQAGTLLGTALAFGTRL
25  ***  *****  *****  **  **  *****  *  *  *  *  *  *  *
RN YGLTLDVSGGLNVYQTQLLFGAVELPSKIMVYFLVRRLGRRLTEAGMLLGAALTFTGSL
HP LVSSDMKSWSTVLAVMGKAFSEAAFTTAYLFTSELYPTVLRQTGMGLTALVGRLGGSLAP
    ***  *** *  *  *****  *****  *****  *****
RN LVSLETKSWITALVVVGKAFSEAAFTTAYLFTSELYPTVLRQTGLGLTALMGRLGASLAR
30  HP LAALLDGVWLSLPKLTYGIIALLAAGTALLLPETRQAQLPETIQDVERKSAPTSLQEEEM
    *****  ***  *****  *  *****  *****  *****  *  ***
RN LAALLDGVWLLLPKVAYGGIALVAAGTALLLPETKKAQLPETIQDVERK----STQEE--
HP PMKQVQN
35  RN -----DV

```

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AI016020) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP03116> (SEQ ID NOS: 36, 46, and 56)

Determination of the whole base sequence of the cDNA insert of clone HP03116 obtained from cDNA library of human epidermoid carcinoma cell line KB revealed the structure consisting of a 32-bp 5'-untranslated region, a 945-bp ORF, and a 110-bp 3'-untranslated region. The ORF encodes a protein consisting of 314 amino acid residues and there existed a putative secretory signal at the N-terminus. Figure 16 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. Application of the (-3,-1) rule, a method for predicting the cleavage site of the secretory signal sequence, allows to expect that the mature protein starts from lysine at position 20. In addition, there exist in the amino acid sequence of this protein three sites at which N-glycosylation may occur (Asn-Arg-Thr at position 167, Asn-Asn-Ser at position 200 and Asn-Ile-Ser at position 273).

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the human Prostasin (SWISS-PROT Accession No. Q16651). Table 13 shows the comparison between amino acid sequences of the human protein of the present

invention (HP) and the human Prostasin (PR). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 39.8% in the entire region.

Table 13

---

10	HP	MGARGALLLALLLARAGLRKPESQEAAPLSGPCGRRVITSRIVGGEDAELGRWPW
		..*.* . . * ** .... * . ***** . ***** * .***
	PR	MAQKGVLPGLGAVAILLYLGLLRSGTG-AEGAEAPCG-VAPQARITGGSSAVAGQWPW
	HP	QGSRLWDSHVCVSLLSHRWALTAAHCFETYSDLSDPSGWMVQFGQLTSMPSFWSLQAY
		* * . ***** * . * . * . * . * . * . * . * . * . * . * . *
15	PR	QVSITYEGVHVCGLVSEQWVLSAAHCF---PSEHHKEAYEVKLGA-HQLDSY---SED
	HP	YTRYFVSNIYLSPRYLGNSPY-DIALVKLSAPVTTYTKHIQPICLQASTFEFENRTDCWVT
		. ...* * . * . * . * . * . * . * . * . * . * . * . * . * . *
	PR	AKVSTLKDIIHPHPSYLQEGSQGDIALQLSRPITFSRYIRPICLPAANASFPNGLHCTVT
	HP	GWGYIKEDALPSPHTLQEVQVAIINNSMCNHLF-LKYSFRKDIF--GDMVCAGNAQGGK
20		***. . . * . * . * . * . * . * . * . * . * . * . * . * . *
	PR	GWGHVAPSVSLLTPKPLQQLLEVPLISRETCNCLYNIDAKPEEPHFVQEDMVCAGYVEGGK
	HP	DACFGDSGGPLACNKNGLWYQIGVVSWSGCGRPNRPGVYTNISHHFEWIKLMAQSGMS
		*** ***** . * . ***** . * . ***** . * . ***** . * . ***** . *
	PR	DACQGDGGPLSCPVEGLWYLTGIVSWGDCGARNRPGVYTLASSYASWIKSVTELQPR
25	HP	QPDPSWPLLFPLWALPLLGPV
	PR	VVPQTQESQPDNLCGSHLAFSSAPAQGLLRPILFLPLGLALGLLSPWLSEH

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30 Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA159101) among ESTs. However, since they are partial sequences, it can not be judged whether or

not they encode the same protein as the protein of the present invention.

<HP10618> (SEQ ID NOS: 37, 47, and 57)

5           Determination of the whole base sequence of the cDNA  
insert of clone HP10618 obtained from cDNA library of human  
fibrosarcoma cell line HT-1080 revealed the structure  
consisting of a 215-bp 5'-untranslated region, a 285-bp ORF,  
and a 1194-bp 3'-untranslated region. The ORF encodes a  
10 protein consisting of 94 amino acid residues and there  
existed a putative transmembrane domain at the N-terminus.  
Figure 17 depicts the hydrophobicity/hydrophilicity profile,  
obtained by the Kyte-Doolittle method, of the present  
protein. In vitro translation resulted in formation of a  
15 translation product of 10 kDa that was almost identical with  
the molecular weight of 9,709 predicted from the ORF.

Furthermore, the search of the GenBank using the base  
sequences of the present cDNA has revealed the registration  
of sequences that shared a homology of 90% or more (for  
20 example, Accession No. AA287125) among ESTs. However, since  
they are partial sequences, it can not be judged whether or  
not they encode the same protein as the protein of the  
present invention.

25           <HP10619> (SEQ ID NOS: 38, 48, and 58)

Determination of the whole base sequence of the cDNA  
insert of clone HP10619 obtained from cDNA library of the  
human fibrosarcoma cell line HT-1080 revealed the structure  
consisting of a 11-bp 5'-untranslated region, a 657-bp ORF,  
30 and a 854-bp 3'-untranslated region. The ORF encodes a  
protein consisting of 218 amino acid residues and there  
existed a putative transmembrane domain at the N-terminus.



Figure 18 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of high molecular weight.

5 Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. Z43089) among ESTs. However, since they are partial sequences, it can not be judged whether or  
10 not they encode the same protein as the protein of the present invention.

<HP10622> (SEQ ID NOS: 39, 49, and 59)

Determination of the whole base sequence of the cDNA  
15 insert of clone HP10622 obtained from cDNA library of the human liver revealed the structure consisting of a 43-bp 5'-untranslated region, a 1383-bp ORF, and a 165-bp 3'-untranslated region. The ORF encodes a protein consisting of 460 amino acid residues and there existed a putative  
20 secretory signal at the N-terminus. Figure 19 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. Application of the (-3,-1) rule, a method for predicting the cleavage site of the secretory signal sequence, allows to expect that the  
25 mature protein starts from serine at position 17. In addition, there exist in the amino acid sequence of this protein four sites at which N-glycosylation may occur (Asn-Ser-Ser at position 23, Asn-Met-Ser at position 115, Asn-Glu-Thr at position 296 and Asn-Tyr-Thr at position 357).

30 The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the human angiopoietin-1 (GenBank

Accession No. U83508). Table 14 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the human angiopoietin-1 (AN). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 28.2% in the entire region and a homology of 39.1% in the C-terminal region of 215 amino acid residues.

Table 14

HP	MFTIKLLLFIVPLVISS
5	AN MTVFLSFAFLAAILTHIGCSNQRRSPENSGRRYNRIQHGCAYTFILPEHDGNCRESTTD HP RIDQDNSSFDSLSPKSRFAMLDVVKILANGLLQLGHGLKDF-VHKTGQINDIFQKLN ** . . . * . . . . . * . . . * . . . . . * . . .
10	AN QYNTNALQORDAPHVEPDFSSQKLQHLEHVMENYTQWLQKLENYIVENMKSEMAQI-QQNA HP IFDQSFYDLSLQTSSEIKKEEKEELRR-TTYKLQVKNEEVKNMSLELNSKLESILLEEKILLO . . . . * . . * . . . . . * . . . * . . . . . * . . . . . * . . . AN VQNHTATMLEIGTSLLSQTAEQTRKLTQVETQVLNQTSLRLEIQLENSLSTYKLEKQLLO HP QKVKYLE-EQLTNLIQNQPETPEHPEVTSKTFVEKQDINSIKDLLQTVEDQYKQLNQQHS * . . * . . . * . . . . . * . . . * . . . . . * . . . . . * . . .
15	AN QTNEILKIHEKNSLLEHKILEMEGKHKEELDTLKEEKEN-LQGLVTRQTYIIQELEKQLN HP QIKEIENQLRRTSIQEPTEISLSSKPRAPRTTPFLQLNEIRNVKHDGIPAECTTIYNRGE . . . . * . . . . * . . . . . . . . . . . . . . . * . . . . . * . . . AN RATTNNSVLQKQQL-ELMDTVHNLVNLCTKEGVLL--KGGKREEEKPFR-DCADVYQAGF HP HTSGMYAIRPSN-SQVFHVYCDV-ISGSPWTLIQHRIDGSQNFNETWENYKYGFGRLDGE . . . . * . . . . * . . . . . . . . . . . . . . . * . . . . . * . . .
20	AN NKSGIYTIYINNMPEPKVFCNMDVNGGGWTVIQHREDGSILDFQRGWKEYKMGFGNPSGE HP FWLGLEKIYSIVKQSNYVLRIELEDWKDNKHYIEY-SFYLGNHETNYTLHLVAITGNVNP . . . . * . . . . . . . . . . . . . . . * . . . . . . . . . . . * . . . AN YWLGNEFIFAITSQRQYMLRIELMDWEGNRAYSQYDRFHIGNEKQNYRLYLKGHTGTAGK HP AIP-ENKDLVFSTWDHKAKGHF-NCPEGYSGGWWHDECGENNLNGKYNKPRAKSKPERR . . . . * . . . . . . . . . . . . . . . * . . . . . . . . . . . * . . .
25	AN QSSLILHGADFSTKDADNDNCMCKCALMLTGGWWF-DACGPSNLNGMFY--TAGQNHGKL HP RGLSWKSQNGRLYSIKSTKMLIHPTDSESFE . . . . * . . . . . . . . . . . . . . . * . . . . . . . . . . . * . . .
30	AN NGIKWHYFKGPSYSLRSTTMMIRPLDF

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for

example, Accession No. R86161) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

5

<HP10625> (SEQ ID NOS: 40, 50, and 60)

Determination of the whole base sequence of the cDNA insert of clone HP10625 obtained from cDNA library of the human liver revealed the structure consisting of a 133-bp  
10 5'-untranslated region, a 651-bp ORF, and a 465-bp 3'-untranslated region. The ORF encodes a protein consisting of 216 amino acid residues and there existed two putative transmembrane domains. Figure 20 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-  
15 Doolittle method, of the present protein.

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. R59052) among ESTs. However, since  
20 they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP02883> (SEQ ID NOS: 61, 71, and 81)

25 Determination of the whole base sequence of the cDNA insert of clone HP02883 obtained from cDNA library of human epidermoid carcinoma cell line KB revealed the structure consisting of a 191-bp 5'-untranslated region, a 1179-bp ORF, and a 2657-bp 3'-untranslated region. The ORF encodes a  
30 protein consisting of 392 amino acid residues and there existed three putative transmembrane domains. Figure 21 depicts the hydrophobicity/hydrophilicity profile, obtained

by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 40 kDa that was almost identical with the molecular weight of 43,381 predicted from the ORF.

5       The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the *Caenorhabditis elegans* hypothetical protein CET24F1.2 (GenBank Accession No. Z49912). Table 15 shows the comparison between amino acid  
10       sequences of the human protein of the present invention (HP) and the *Caenorhabditis elegans* hypothetical protein CET24F1.2 (CE). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue  
15       similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 35.4% in the N-terminal region of 178 amino acid residues.

Table 15

20	HP	MEGVSALLARCPTAGLAGGLGVTACAAAGVLLYRIARRMKPTHTMVNCWFCNQDTLVPYG	
			*. .**.* * . . . * .*****. . . * *
	CE	MEVAAAVGVIASVPILYK-AIRPR-IKTSVECWFCKSTKVEYQ	
	HP	NRNCWDCPHCEQYNGFQENG DY NKPIPAQ-----YLEHLNHVSSAPSLRDP-SQPQQ	
25		.**.....* ***** *.*****.***.*	* * . . . . . * . . .
	CE	QRNSFTCPSC EQYNGFTEDGDYNNRIPGQAWTPKRYCEPGKMQSEKPSTFLDRFGGVNM	
	HP	WVSSQVLLCKRCNHHQTTKIKQLAAAFAPREEGRYDEEVEVYRHHLEQMYKLCRPCQAAVE	
		.. **.* * * . . . . . * . * . * . * . * . * . * . * . * . * . *	
	CE	SPKASNGLCSECNLGQEIIMNKVAEFEPIDEDRWNEELEDYRYKLERMYQLCPRCTIQVH	
30	HP	YYIKHQNRQLRALLLSHQFKRREADQTHAQNFSSAVKSPVQVILLRALAFLACAFLLTTA	
		..... .**.* * *	
	CE	GKLEEDKKKY-SYLLKVYKYLKHAIGSTLREVMNNQKRSRRFFFAGGSTCEALHFGCLIS	

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for  
5 example, Accession No. F11409) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

10 <HP03140> (SEQ ID NOS: 62, 72, and 82)

Determination of the whole base sequence of the cDNA insert of clone HP03140 obtained from cDNA library of human fibrosarcoma cell line HT-1080 revealed the structure consisting of a 29-bp 5'-untranslated region, a 1494-bp ORF,  
15 and a 972-bp 3'-untranslated region. The ORF encodes a protein consisting of 497 amino acid residues and there existed one putative transmembrane domain. Figure 22 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro  
20 translation resulted in formation of a translation product of 51 kDa that was almost identical with the molecular weight of 54,245 predicted from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the  
25 protein was similar to the *Caenorhabditis elegans* hypothetical protein CELC50D2 (GenBank Accession No. AF040642). Table 16 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the *Caenorhabditis elegans* hypothetical protein CELC50D2  
30 (CE). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that

HP MALWRGSAYAGFLALAVGCVFLLEPELPGSALRSLWSSLCLGPAPPPGPVSPEGRLAAA

\* \* \* \* \*

10

HP WDALIVRPVRRWRRVAVGVNACVDVVLSGVKLLQALGLSPGNGKDHSLHSRNDLEEAFI

\* .    \*\* . \*    . . . . . \*   \*    \*\* . . . \*\*\* . . . . \*\* .    . . . \*\*\* . . . \* . . .    . \*\* . . . \*

CE WERAIVKPGAMFKKAVIGFNCNVDLIVSGVRVVDALNTTCSEGKDQETLETLADLHQTFA

HP HFMWKGAAERFFSDKETFHDIAQVASEFPGAQHYVGGNAALIGQKFAAN-SDLKVLLCG

\*\*\*. \*\*\*\*\*. \*... \*... \*... \*... \*... \*\*\*\*\*. ....\*\*\* .. \* \* \*

15

CE HFFQRGAAAERYMSSDQFNLLVAESEASTRSHHHIGGNAALMADRIAANFPSTEVYLVG

HP PVGPRLHELLDDNVFVPPESLQEVDEFHLILEYQAGEEWGOLKAPHANRFIFSHDLSNGA

\*.\*\*\* ..\*\*.\* \* .. \*\*.\* \*\*.\* \*\*.\* \*\*.\* \*\*.\*

CE PIGPRSOALLHPSVKRTNSTRLKDELHVILEYKQGEILGDWVAPSSSRFITSHDHFSGS

HP MNMLEV FVSSLEEFQPD LVVLSGLHMMEGQSKELQRKRLL E VVTSISDIPTGIPVHLELA

20

\* . . \* . \* . . . . \* . \* \* \* \* . . \* . \* . . \* \* \* \* . . . . . . . . . \* \* . . \* . \* \* \* \* .

CE MVVMEFFKAIAOFRPDLVVITGVHLLFOSKEMROEKMRLIKRNLLQIPPKVPIHLELG

HP SMTNRELMSSIVHOOVFPVTSGLGLNEOELLFLTOSASGPH-SSLSSWNGVPDVGMVSDI

\* . . \* . . \* . . \* . . \* . . \* . . \* . . \* . . \*

CE SLAD-EIFSTDVINKILPYVDSLGINEOELTFLSHIANGPHMEEYPVOAGTVHVHKVVEM

25

HP LFWILKEHGR-----SKSRASDLTRIHFTLVYHILATVDGHWANQLAAVAAGARVAGT

\* \* \* \* \*

CE LHWLLKTYGRDPTGOIASKTGYRLSRIHFHCLTYHIMVSSGTDWSNLAAGLAAGARIAGR

HP OAC--ATETIDTSRVSLRAPOEFMTSHSEAGSRIVLNPKNPVVEWHREGISFHFPTVLVC

\* \* \* \* \*

30

CE LSCNIGANTMDSELLEIRTPANFVLDDKIEKNYOFFAHKYMLTPFNIARCSTRLIRRKPP

HP KDPIRTVGLGDAISAEGLFYSEVHPHY

CE GGGILDEGVTESDVHNVILNPTTRI.PYRFEOLREHIEKTSSEIMKERNKIRYGTBKKKDS

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA356000) among ESTs. However, since  
5 they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP10628> (SEQ ID NOS: 63, 73, and 83)

10 Determination of the whole base sequence of the cDNA insert of clone HP10628 obtained from cDNA library of human fibrosarcoma cell line HT-1080 revealed the structure consisting of a 66-bp 5'-untranslated region, a 1254-bp ORF, and a 297-bp 3'-untranslated region. The ORF encodes a  
15 protein consisting of 417 amino acid residues and there existed four putative transmembrane domains. Figure 23 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation  
20 product of 46 kDa that was almost identical with the molecular weight of 45,461 predicted from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the Schistosoma mansoni ATP-cassette  
25 family protein (GenBank Accession No. L26286). Table 17 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the Schistosoma mansoni ATP-cassette family protein (SM). Therein, the marks of -, \*, and . represent a gap, an amino  
30 acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The



both proteins shared a homology of 39.5% in the C-terminal region of 294 amino acid residues.

Table 17

5	HP MLVHLFRVGIRGGPFPGRIPLPLRFQTFSAVRYSDGYRSSSILRAVAHLRSQWHLPRAS
	SM MFSALCRRGFLTNNKVSQFRSTYKCDHYNLKT
	HP PLAPRWSPSAWCWVGALLGPMVLSKPHLCLVALCEAEAPPASSTPHVVGSRFNWKLF
	SM HIKPLKCSSSLRLTVGTGLFIALHISKISPESRIQTVQCEVDSYQTDQITFAKSGGIPRYI
10	HP WQFLHPHLLVLGVAVVLALGAALVNVQIPLLLGQLVVAKYTRDHVGSFMTESQNLSTH
	.. * . . * * . . * . * . * . * . * . * . * . * . * . * . * . * . * . * .
	SM GVLILPDCVYLFGAILGAFVAAMNVYIPLYLGDFVSSLSRCVVTHEG-FVSAVYVPTLR
	HP LLILYGVQGLLTFGYLVLLSHVGERMAVDMRRALFSSLLRYCQPQGAELGQDITFFDANK
	* * . * . * . * . * . * . * . * . * . * . * . * . * . * . * . * . * .
15	SM LCSSYLLQSLSTFLYIGLLGSVGERMARRMRIQLFRKLV-Y-----QDVAYFDVHS
	HP TGQLVSRLLTDVQEFKSSFKLVISQGLRSCQVAGCLVSLSMLSTRLLTLLMVATPALMG
	. * . * . . . * . * . * . * . * . * . * . * . * . * . * . * . * . * .
	SM SGKLVEIIGSDVQNFKSSFQKQISQGLRNGIQVVGSVFALLSISPTLTAALIGCLPCVFL
	HP VGTLMGSLRKLSCQCQEIQIARAMGVADALGNVVRTVRAFAMEQREEERYGALEACRCR
20	. * . * . * . * . * . * . * . * . * . * . * . * . * . * . * . * . * .
	SM IGSLMGTELRLHISREVQSQNSLFASLIDEAFSHIRTVKSLAMEDFLINKINYNDKAKML
	HP AEELGRGIALFQGLSNIAFNCMVLGTLFIGGSLVAGQQLTGDLMSFLVASQTVQRL
	. * . * . * . * . * . * . * . * . * . * . * . * . * . * . * . * . * .
25	SM SEKLSFGIGSFQGLSNLTNLNGVVLGVLYVGGHLSRGELDAGHLMSFLATTQTLQRLSQ

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. U66688) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP10629> (SEQ ID NOS: 64, 74, and 84)

Determination of the whole base sequence of the cDNA insert of clone HP10629 obtained from cDNA library of human retinoblastoma cell line WERI-RB revealed the structure  
5 consisting of a 259-bp 5'-untranslated region, a 1950-bp ORF, and a 1060-bp 3'-untranslated region. The ORF encodes a protein consisting of 649 amino acid residues and there existed at least eight putative transmembrane domains. Figure 24 depicts the hydrophobicity/hydrophilicity profile,  
10 obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of high molecular weight.

The search of the protein data base using the amino acid sequence of the present protein revealed that the  
15 protein was similar to the *Caenorhabditis elegans* hypothetical protein CELF38B6 (GenBank Accession No. U40060). Table 18 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the *Caenorhabditis elegans* hypothetical protein CELF38B6 (CE).  
20 Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 39.1% in the C-terminal  
25 region of 445 amino acid residues.

Table 18

---

HP MIPNQHNAGAGSHQPAVFRMAVLDTDLHDHILPSSVLPPFWAKLVVGSVAIVCFARSYDGD  
 CE MKYAEINVNSGKHFRNLNYKLHETS  
 5 HP FVFDDSEAIVNNKVAGVVGRADLLCALFFLLSFLGYCKAFRESNKEGAHSSTFWLLSIF  
 CE TLGYHVVNIICTVATLVFYKLGKQLEHIFDFFNIAFSASILFAVHPVHTEAVANITGRA  
 HP LGAVAMLCKEQGITVLGLNAVFDILVIGKFNVLVLEIVQKVLHKDKSLENLGMRLNGGLLFR  
 CE ELLMTIFSLAALILHVKNREINCKFVLLVILSTLSKEQGLMTIPIAICIDFLAHRSCRSN  
 HP MTLTSGGAGMLYVRWRIMGTGPPAFTEVDNPASFADSMVRAVNYNYYYSLNAWLLLC  
 10                   ..\* .. \* ... \*\*..\*\*\*..\* .\*. \* .\*\*\*. . .\*.\*\*\*. \*  
 CE FVRMICLLVAIGFLRMMVNGFEAAKFTKLDNPTAFLNSKFYRMINYTYIWLHAYLLVIP  
 HP WWLCFDWSMGCIPLIKSIWDVRVIALAALWFCGLIGLICQALCEDGHKRRILTLGLGFLV  
                   \*\*\*\*.\*\*\*\*\*. .... \* . \*\*\*\*. . \* . \* . . . \* .\*\* . . .  
 CE VNLCFDYSMGCISSITM--WDLRALSPVLIFTIVIIGVKF----QNECRAFTLSSLMGI  
 15 HP IPFLPASNLFFRVGFVVAERVLVLPISIGYCVLLTFGFGALSKHTKKKKLIAAVVLGILFI  
                   \*.\*\*\*\*\*. \*\* \*\*\* .\*\*\*\*\*. \*. \* . . \* \*\* \* . . . . . \* .  
 CE ISFLPASNIFFTVGFSIAERVLYLPSAGFCLLCAIIFKKLSVHFKNADVLSITLILLIS  
 HP NTLRCVLRSGEWRSEEQLFRSALSVCPLNAKVHYNIGKNLADKGNQTAAIRYREAVRLN  
                   . \* \*       \*\*\*\*. \* . \* .\*\*\*\*\*. \*\*\*\*.\*\*\*. \* . \* . \* . \* . \* .  
 20 CE KTYR---RSGEWKTELSLYSSGLSVCPTNAKIHYNLGKVLGDNGLTKDAEKYNAIKLD  
 HP PKYVHAMNNGNILKERNELQEAELLSLAVQIQPDFAAAWMNLGIVQNSLKRFEAAEQS  
                   \*. \* .\*.\*\*\*\*\*. .... .\*\*\*.\*\*\*. \*\* ..\*.\*\*\*.\*\*\*\*\*. \* .\*\*\*. .\*\*\*.  
 CE PSYEQALNNLGNLLEKSGDSKTAESLLARAVTLRPSFAVAMNNGISQMNLKYYEAEKS  
 HP YRTAIKHRRKYPDCYYNLGRLYADLNRHVDALNAWRNATVLKPEHSLAWNMIILLDNTG  
 25                   .... \* . . \* .\*\*\* \*\* . \*\* . \* .\*\*\*.\*\*\*. .\*. \*\* .\*.\*\*\*\*\*. .  
 CE LKNSLLIRPNSAHCLFNLGVLYQRTNRDEMAMSAWKNATRIDSQSWTNLFVVDHLS  
 HP NLAQAEAVGREALELIPNDHSLMFSANVLGKSQKYKESEALFLKAIKANPNAASYHGNI  
                   . . \*. . . .\*\*\*. \*\*\*. . . . . \* . . . . . \* . \*\* . \*\*\*. .\*\*\*  
 CE QCSQVIDLSYQALSSVPNESRVHMQIGSCHAKHSNFTAAENHIKSAIDLNPSTSVLFHANL  
 30 HP AVLYHRWGHLDLAKKHYEISLQLDPTASGTKENYGLLRKLELMQKKAV  
                   ..\*\*\*. \* . . \* . \* . \* . \* . \* . \* . \* . \* . \* . \* . \* . \* .  
 CE GILYQRMRSRHEAESQYRIVLALDSKNIVAKQNLQKLEEHNCYNSTLP

---

sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA450191) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP10635> (SEQ ID NOS: 65, 75, and 85)

Determination of the whole base sequence of the cDNA insert of clone HP10635 obtained from cDNA library of human retinoblastoma cell line WERI-RB revealed the structure consisting of a 65-bp 5'-untranslated region, a 282-bp ORF, and a 111-bp 3'-untranslated region. The ORF encodes a protein consisting of 93 amino acid residues and there existed two putative transmembrane domains. Figure 25 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 10 kDa that was almost identical with the molecular weight of 9,489 predicted from the ORF.

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA516481) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP10636> (SEQ ID NOS: 66, 76, and 86)

Determination of the whole base sequence of the cDNA insert of clone HP10636 obtained from cDNA library of human fibrosarcoma cell line HT-1080 revealed the structure

consisting of a 179-bp 5'-untranslated region, a 1278-bp ORF, and a 255-bp 3'-untranslated region. The ORF encodes a protein consisting of 425 amino acid residues and there existed ten putative transmembrane domains. Figure 26 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of high molecular weight.

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. Z43270) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP10640> (SEQ ID NOS: 67, 77, and 87)

Determination of the whole base sequence of the cDNA insert of clone HP10640 obtained from cDNA library of human retinoblastoma cell line WERI-RB revealed the structure consisting of a 52-bp 5'-untranslated region, a 450-bp ORF, and a 553-bp 3'-untranslated region. The ORF encodes a protein consisting of 149 amino acid residues and there existed at least two putative transmembrane domains. Figure 27 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 17 kDa that was almost identical with the molecular weight of 16,829 predicted from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the *Arabidopsis thaliana* hypothetical

protein F27F23.14 (GenBank Accession No. AC003058). Table 19 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the Arabidopsis thaliana hypothetical protein F27F23.14 (AT).  
 5 Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 46.5% in the entire  
 10 region other than the N-terminal region.

Table 19

	HP	METLYRVPFLVLECPNLKLLKKPPWLHMPSTVYA
15		*** * *.*** * . .***.*****
	AT	MAPRSDSQTGSSVSDGSDQSSMDPIFHLLRIVPFSFLRPPRLRLKIPS-FTLPSPMTVYA
	HP	LVVVSYFLITGGIIYDVIVEPPSVGSMTD-EHGHQRPVAFLAYRVNGQYIMEGLASSFLF
		*.....*.....*.....* * . * ***.*..*****.***.*.*.*
	AT	LILLTYFLVVS GFVYDVIVEPPGIGSTQDPTTGTIRPVVFMSGRVNGQYIIEGLSSGFMF
20	HP	TMGGLGFIIIDRSNAPNIPKLNRFLLFFIGFVCVLLSFFMARVFMRMKLPGYLMG
		..***.*.....* . . * . * . * .....*.....*.....*
	AT	VLGGIGIVMLDLALDKNKAKSVKASYAVAGVSSIVIAVMSMLFIRIKIPGYLY

25 Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. N34717) among ESTs. However, since they are partial sequences, it can not be judged whether or  
 30 not they encode the same protein as the protein of the present invention.

<HP10644> (SEQ ID NOS: 68, 78, and 88)

Determination of the whole base sequence of the cDNA insert of clone HP10644 obtained from cDNA library of the human retinoblastoma cell line WERI-RB revealed the structure consisting of a 221-bp 5'-untranslated region, a  
5 1191-bp ORF, and a 204-bp 3'-untranslated region. The ORF encodes a protein consisting of 396 amino acid residues and there existed two putative transmembrane domains. Figure 28 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein.

10 The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the *Caenorhabditis elegans* hypothetical protein B0511.8 (GenBank Accession No. AF067608). Table 20 shows the comparison between amino acid  
15 sequences of the human protein of the present invention (HS) and the *Caenorhabditis elegans* hypothetical protein B0511.8 (CE). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that  
20 of the protein of the present invention, respectively. The both proteins shared a homology of 31.3% in the region of 361 amino acid residues other than the N-terminal region and the C-terminal region.

Table 20

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	HS	MAMIELGFGRQNFHPLKRKSSILLKL
	CE	CDKNGQYLSVQEEIDAENKVQRKIAPGLNEKVLERVTOMLMKQEKSTETYSIWLKNLKRV
5	HS	IAVVFAVLLFCEFLIYYLAIFQCNWPEVKTTASDGEQTTREPVLKAMFLADTHLLGEFLG
		* ... .. *... *... .. *... .. *... .. *
	CE	ILLAILLVYNEYFIFFIASFSSCQWP-----CKYGRCS-ESSVKAFMISDTHLLGKING
	HS	HWLDKLRREWQMERAFQTALWLLQPEVVFILGDIFDEGKWSTPEAWADDVERFQKMFHRP
		*****.***** ..* ..* ..*...*****.*****... ..*...*
10	CE	HWLDKLRREWQMYQSFWISTWIHSPDVTFFLGDLMDGKWAGRPFVFEAYAERFKKLF--G
	HS	SHVQLKVVAGNHDIGFHYEMNTYKVERFEKVFSSERLFSWKGINFVMVNSVALNGDGCIG
		.. .. *****.***** ..* ..* ..* ..* ..* ..* ..* ..*
	CE	DNEKVITLAGNHDLGPHYAL----VQTFATHLTPT--VELKNYLLIMPETLEMFKKEFRR
	HS	CSETEAELIEVSHRLNCSREARG-SSR-CGPGPL-----LPTSAPVLLQHYPLYRRS
15		* .. .. * ..* ..* ..* ..* ..* ..* ..* ..* ..* ..*
	CE	GLIDEMKIKKHRFVLINSMAMHGDGCRLCHEAELILEKIKSRNPNRPIVLQHFPLYRKS
	HS	DANCSGEDAAPAEERDIPFKENYDVLVSREASQKLLWWLQPRVLVSGHHSAC-----EVH
		**.* ..* ..* ..* ..* ..* ..* ..* ..* ..* ..* ..*
	CE	DAECDQVDEQHEIDLKEMYREQWDTLSKESLQIIDSLNPKAVFGGHTHKMCKKKWNKTG
20	HS	HGGRVPELSVPSFSWRNRNPNPSFIMGSIPTDYTLKCYLPREDVVLIIYC-GVVGLFV
		... * ..* ..* ..* ..* ..* ..* ..* ..* ..* ..* ..*
	CE	NSEYFYEYTVNSFSWRNGDVPAMLLVVIDGDNVLVSSCRLPSEILQIMVYIFGGIGILAK
	HS	LTLTHFGLLASPFLSGLNLLGKRKTR
25	CE	MYNDLITPALEWNVNNIAVCTAILVMIINVVALIFTIFWCLRSKDEGGEIDSNGVVIN

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Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. R88381) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.



<HP10656> (SEQ ID NOS: 69, 79, and 89)

Determination of the whole base sequence of the cDNA insert of clone HP10656 obtained from cDNA library of the human lymphoma cell line U937 revealed the structure consisting of a 68-bp 5'-untranslated region, a 1053-bp ORF, and a 739-bp 3'-untranslated region. The ORF encodes a protein consisting of 350 amino acid residues and there existed two putative transmembrane domains. Figure 29 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 41 kDa that was almost identical with the molecular weight of 40,043 predicted from the ORF. In this case, the addition of a microsome led to the formation of a product of 54 kDa to which sugar chains are presumably attached. In addition, there exist in the amino acid sequence of this protein four sites at which N-glycosylation may occur (Asn-Cys-Thr at position 148, Asn-Tyr-Thr at position 155, Asn-Gln-Thr at position 162 and Asn-Lys-Ser at position 190).

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA917816) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP10672> (SEQ ID NOS: 70, 80, and 90)

Determination of the whole base sequence of the cDNA insert of clone HP10672 obtained from cDNA library of the

human thymus revealed the structure consisting of a 244-bp 5'-untranslated region, a 462-bp ORF, and a 77-bp 3'-untranslated region. The ORF encodes a protein consisting of 153 amino acid residues and there existed a putative  
5 secretory signal at the N-terminus and one putative transmembrane domain at the C-terminus. Figure 30 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. When expressed in COS cells, a product of 17 kDa was observed in  
10 the membrane fraction.

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. N48700) among ESTs. However, since  
15 they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP03194> (SEQ ID NOS: 91, 101, and 111)

20 Determination of the whole base sequence of the cDNA insert of clone HP03194 obtained from cDNA library of human epidermoid carcinoma cell line KB revealed the structure consisting of a 120-bp 5'-untranslated region, a 912-bp ORF, and a 2406-bp 3'-untranslated region. The ORF encodes a  
25 protein consisting of 303 amino acid residues and there existed four putative transmembrane domains. Figure 31 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation  
30 product of high molecular weight.

The search of the protein data base using the amino acid sequence of the present protein revealed that the

protein was similar to the mouse hyperpolarization-activated cation channel HAC3 (GenBank Accession No. AJ225124). Table 21 shows the comparison between amino acid sequences of the human protein of the present invention (HS) and the mouse hyperpolarization-activated cation channel HAC3 (MM). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 92.5% in the N-terminal region of 293 amino acid residues.

Table 21

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15	HS MEAEQRPAAGASEGATPGLEAVPPVAPPPATAASGPIPKSGPEPKRRHLGTLLOPTVNKF *.*.*****.*.***. *. **.*.*.* **** *.*.*****.***** MM MEEEARPAAGAGEAATPARET-PPAAPAQARAASGGVPESAPEPKRRQLGTLLOPTVNKF HS SLRVFGSHKAVEIEQERVKSAGAWIHPYSDFRFYWDLIMLLLMVGNLIVLPVGITFFKE *****
20	MM SLRVFGSHKAVEIEQERVKSAGAWIHPYSDFRFYWDLIMLLLMVGNLIVLPVGITFFKE HS ENSPPWIVFNVLSDTFFLLDLVLNFRGTGIVVEEGAEILLAPRAIRTRYLRTWFLVDLISS ***** MM ENSPPWIVFNVLSDTFFLLDLVLNFRGTGIVVEEGAEILLAPRAIRTRYLRTWFLVDLISS HS IPVDIYIFLVVELEPRLDAEVYKTARALRIVRFTKILSLLRLLRLSRLIRYIHQWEEIFHM *****
25	MM IPVDIYIFLVVELEPRLDAEVYKTARALRIVRFTKILSLLRLLRLSRLIRYIHQWEEIFHM HS TYDLASAVVRIFNLIGMMLLLCHWDGCLQFLVPMLQDFPPDCWVSINHMVVRSPHSSAFP *****.*.***.* MM TYDLASAVVRIFNLIGMMLLLCHWDGCLQFLVPMLQDFPDCWVSMNRMVNHWSGRQYSH
30	HS GPS MM ALFKAMSHMLCIGYGQQAPVGMPDVWLTMLSMIVGATCYAMFIGHATALIQSLDSSRRQY

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Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AI571225) among ESTs. However, since  
5 they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP03219> (SEQ ID NOS: 92, 102, and 112)

10 Determination of the whole base sequence of the cDNA insert of clone HP03219 obtained from cDNA library of human lymphoma cell line U937 revealed the structure consisting of a 55-bp 5'-untranslated region, a 852-bp ORF, and a 237-bp 3'-untranslated region. The ORF encodes a protein consisting  
15 of 283 amino acid residues and there existed four putative transmembrane domains. Figure 32 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product  
20 of high molecular weight.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the human putative membrane protein 54TmP (GenBank Accession No. AF004876). Table 22 shows the  
25 comparison between amino acid sequences of the human protein of the present invention (HS) and the human putative membrane protein 54TmP (TM). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino  
30 acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 56.5% in the entire region.

Table 22

HS MADPHQLFDDTSSAQSRGYGAQRAPGGLSYPAASPT-PHAAF  
5 . \*\* .. \*\*\*\*\* \* \*\*..\* \*\*\* . . .\*. . . .  
TM MAYHSGYGAGHSGKHRARAAPDPPLFDDT----SGGYSSQ--PGGYPATGADVAFSVNHL  
HS LADPVSNMAMAYGSSLAAQGKELVDKNIDRFIPITKLKYFFAVDTMYVGRKLGLLFFPYL  
. \*\*. . .\*\*\*\*\*.\*..\*\*..\*.....\*\*\*\*\*.\*\*\*\*\* \*\*..\*\*\*\*\* \*\*\*  
TM LGDPMANVAMAYGSSIASHGKDMVHKELHRFVS VSKLKYFFAVDTAYVAKKLGLLVFPYT  
10 HS HQDWEVQYQQDTPVAPRFDVNAPDLYIPAMAFITYVLVAGLALGTQDRFSPDLLGLQASS  
\*\*.\*\*\*\*\* .\*. . .\*\* \*.\*\*\*\*\*. ....\*\*\*.\*\*\*.\*\*\*.\*\*\* \*\*.  
TM HQNWEVQYSRDAPLP RPQDLNAPDLYIPTKAFITYVLLAGMALGIQRFSPEVLGLCAST  
HS ALAWLTLEVLAILLSLYLVTVNTDLTTIDLVAFLGYKYVGMIGGVLMGLLFGKIGYYLV  
. \*. . .\*\*\*\*\*.\*.\*\*\*.\*\*\*.\*\*\*.\*\*\*.\*\*\*.\*\*\*.\*\*\*.\*\*\*.\*\*\*.\*\*\*.\*\*\*.\*\*\*  
15 TM ALVVVVMEVLALLLGLYLATVRSDLSTFHLLAYS GYKYVGMILSVLTGLLFGSDGYVAL  
HS GWCCVAIFVMIRTLRLKILADAAAEGVPVRGARNQLRMYLTMVAAAQPMLMYWLT FHL  
. \* . \*. .\*. .\*\* \* .... \* \*\* .\*. . .\*\*\*\*\*.\*\*\* \*\*..\*\*\*\*\*  
TM AWTSSALMYFIVRS LR TAAL-GPDSMGGPV--PRQRLQLYLTLGAAAFQPLIIYWLT FHL  
HS VR  
20 \*\*  
TM VR

Furthermore, the search of the GenBank using the base  
25 sequences of the present cDNA has revealed the registration  
of sequences that shared a homology of 90% or more (for  
example, Accession No. H86659) among ESTs. However, since  
they are partial sequences, it can not be judged whether or  
not they encode the same protein as the protein of the  
30 present invention.

<HP03236> (SEQ ID NOS: 93, 103, and 113)

Determination of the whole base sequence of the cDNA insert of clone HP03236 obtained from cDNA library of human

fibrosarcoma cell line HT-1080 revealed the structure consisting of a 252-bp 5'-untranslated region, a 1467-bp ORF, and a 620-bp 3'-untranslated region. The ORF encodes a protein consisting of 488 amino acid residues and there  
5 existed seven putative transmembrane domains. Figure 33 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of high molecular weight.

10 The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the *Caenorhabditis elegans* hypothetical protein ZC513.5 (GenBank Accession No. U53155). Table 23 shows the comparison between amino acid sequences  
15 of the human protein of the present invention (HS) and the *Caenorhabditis elegans* hypothetical protein ZC513.5 (CE). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that  
20 of the protein of the present invention, respectively. The both proteins shared a homology of 39.5% in the intermediate region of 365 amino acid residues.

Table 23

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HS  MAGKGSSGRRPLLLGLLVAVATVHLVICPYTKVEESFNLQATHDLLYHWQDLEQYDHLEF
                                     .*** .*
5   CE                                     MKMKYDHSQF
HS  PGVVPRTFLGPVVIADVSSPAVYVLSLLEMSKFYSQLIVRGVLGLGVIFGLWTLQKEVRR
    *****.*. ....* .....* .....* .....* .....* .....* .....*
CE  PGVVPRTFIGPISLAILSSPMSFIFRFWAIPKMWQLLIRATLGLMNAMAFLYFARSVNR
HS  HFGAMVATMFCWVTAMQFHLMFYCTRTPNVLALPVLALALAAWLRHEWARFIWLSAFAI
10  .** .* . . . . .*** .** .....* .....* .....* .....* .....*
CE  KFGRETAMYLRLIMCTQFHYIFYMSRPLPNTFALILVMIVFERLLEGRYESAVRYATASV
HS  IVFRVELCLFLGLLLL--LALGNRKV-SVVRALRHAVPAGILCLGLTVAVDSYFWRQLTW
    *** ** * . * . . . . * . * . * . * . * . * . * . * . * . * . *
CE  ILFRCELVLVLYGPIFLGYMISGRKLVFGFDGAIAIGVRIAAMCLAVSIPIDSYFWRGPLW
15  HS  PEGKVLWYNTVLNKSSNWGTSPLLWYFYSALPRGLGCSILFIPLG-LVDRRTHAPTFLAL
    ***.*.....* ** .*** .....* .....* .....* .....* .....* .....*
CE  PEGEVMFFNVVENRSHEYGTQPFLLWYFYSALPRCLLTTTLVPLGLLVDRRLPQIVLPSV
HS  GFMALYSLLPHKELRFIIYAFPLNITAARGCSYLLNNYKKSPLYKAGSLLVIGHLVVNA
    * . ***.....* .....* .....* .....* .....* .....* .....* .....*
20  CE  IFIFLYSFLPHKELRFIIYVLPFCLSAAVFCARMLINRHKSFFRMILFFGVILHLLANV
HS  AYSATALYVSHFNYPGGVAMQ--RLHQLVPPQTDVLLHIDVAAAQTVSRFLQVNSAWRY
    ... * * . **** * . . . . . * . * . * .....* .....* .....*
CE  LCTGMFLLVASKNYPGFDALNYLQFQNRFDKPKVTVYIDNACAQTVNRFHLINDAWT

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25

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA744858) among ESTs. However, since

30 they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP03237> (SEQ ID NOS: 94, 104, and 114)

Determination of the whole base sequence of the cDNA insert of clone HP03237 obtained from cDNA library of human fibrosarcoma cell line HT-1080 revealed the structure consisting of a 101-bp 5'-untranslated region, a 549-bp ORF, and a 1106-bp 3'-untranslated region. The ORF encodes a protein consisting of 182 amino acid residues and there existed four putative transmembrane domains. Figure 34 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the human intestinal membrane A4 protein (SWISS-PROT Accession No. Q04941). Table 24 shows the comparison between amino acid sequences of the human protein of the present invention (HS) and the human intestinal membrane A4 protein (IM). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 32.4% in the intermediate region of 111 amino acid residues.



Table 24

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HS MWPPDPDPDPDEPAGGSRPGPAVPGRLALLPARAFLCSLKGRLLLAESGLSFITFYCYV
                                     ** **.* *.....**
5  IM                               MADSERLSAPGCWAACTNFSRTRKGILLFAEIILCLVILICF-
HS ASSASAFLTAPLLEFLLALYFLFADAMQLNDKWQGLCWPMMDFLRCVTAALIYFAISITA
   ..*..... . ...*....* * . . .*..* . . ** **.* ..**..* .***..
IM SASTPGYSSLSVIEMILAAIFFVVYMCDLHTKIPFINWPWSDFFRTLIAAILYLITSIVV
HS IAKYSDGASKAAGVFGFFATIVFATDFYLIFNDVAKFLKQGDSADETTAHKTEEENSDDSD
10  ... .. . .***.*....* *. * *..*
IM LVERGNHSKIIVAGVLGLIATCLFGYDAYVTFPVRPRHTAAPTDPADGPV

```

Furthermore, the search of the GenBank using the base  
15 sequences of the present cDNA has revealed the registration  
of sequences that shared a homology of 90% or more (for  
example, Accession No. R14227) among ESTs. However, since  
they are partial sequences, it can not be judged whether or  
not they encode the same protein as the protein of the  
20 present invention.

<HP03267> (SEQ ID NOS: 95, 105, and 115)

Determination of the whole base sequence of the cDNA insert of clone HP03267 obtained from cDNA library of human liver revealed the structure consisting of a 148-bp 5'-untranslated region, a 555-bp ORF, and a 715-bp 3'-untranslated region. The ORF encodes a protein consisting of 184 amino acid residues and there existed two putative transmembrane domains. Figure 35 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 21 kDa that was almost identical with the molecular

weight of 20,733 predicted from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the human polyposis locus protein 1 (SWISS-PROT Accession No. Q00765). Table 25 shows the comparison between amino acid sequences of the human protein of the present invention (HS) and the human polyposis locus protein 1 (PL). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 59.1% in the entire region.

15 Table 25

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HS MDGLRQVEHFLEQRNLVTEVLGALEAKTGVEKRYLAAGAVTLLSLYLFGYGASLLCNL
    .*. *..*...* .*. *..* .....* *...*.***.*****
20 HS IGFVYPAYASIKAIESPSPKDDDTVWLTYWVVYALFGLAEFFSDLLSWFPFYVVGKCAFL
    *** **** .....*.*** .....*...*****.*****. **.***
PL IGFGYPAYISIKAIESPKNKEDDTQWLTYWVVYGVFSIAEFFSDIFLSWFPFYMLKCGFL
HS LFCMAPRPWNGALMLYQVRVRLFLRHHGAVDRIMNDLSGRALDAAAGITRNVKPSQTPQ
    *.****.* *** .**.*.....*.*.....*.....*...*...*...*
25 PL LWCMA PPSNGAELLYKRIIRPFLKHESQMDSVVKDLKDKSKETADAITKEAKKATVNL
HS PKDK

PL LGEEKKST

```

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for

example, Accession No. R09702) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

5

<HP03270> (SEQ ID NOS: 96, 106, and 116)

Determination of the whole base sequence of the cDNA insert of clone HP03270 obtained from cDNA library of human lymphoma cell line U937 revealed the structure consisting of a 132-bp 5'-untranslated region, a 423-bp ORF, and a 656-bp 3'-untranslated region. The ORF encodes a protein consisting of 140 amino acid residues and there existed four putative transmembrane domains. Figure 36 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 17 kDa that was somewhat larger than the molecular weight of 15,864 predicted from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the *Schizosaccharomyces pombe* hypothetical protein (EMBL Accession No. AL031854). Table 26 shows the comparison between amino acid sequences of the human protein of the present invention (HS) and the *Schizosaccharomyces pombe* hypothetical protein (SP). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 43.4% in the entire region.



weight of 17,360 predicted from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the *Schizosaccharomyces pombe* hypothetical protein SPBC119.09c (EMBL Accession No. AL022117). Table 27 shows the comparison between amino acid sequences of the human protein of the present invention (HS) and the *Schizosaccharomyces pombe* hypothetical protein SPBC119.09c (SP). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 41.9% in the entire region other than the N-terminal region.

Table 27

HS	MNVGVAHSEVNPNTVRMNSRGMWLTALGVGLLHIVLL
20	. * . * * . . . . * . . .
SP	MGSSSSRRRSSSLVTKVPKPTIDDRLDQGSATNYSNWNVNYKGAWVIHIVLIAALRLIFH
HS	SIPFFSVFVAWTLTNIHNLGMYVFLHAVKGTPTFETPDQ GKARLLTHWEQLDYG VQFTSS
	. ** * . ***** . . . . * * . ***** . . . * ** ***** * * . . .
SP	AIPSVSRELAWTLTNLT YMAGSFIMFHWVTGTPFEFNGGAYDR-LTMWEQLDEGNQYTPA
25	HS RKFFTISPIILYFLASFYTKYDP THFILNTASLLSVLIPKMPQLHGVRIFGINKY
	** . . ***** . ** . * . . . . * . ***** . . . ***** . *
SP	RKYLVLPIILFLMSTHYTHYNGWMFLVNIWALFMVLIPKLPVHRKRIFGIQKLSLRDD

30 Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA043039) among ESTs. However, since

they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

5 <HP10631> (SEQ ID NOS: 98, 108, and 118)

Determination of the whole base sequence of the cDNA insert of clone HP10631 obtained from cDNA library of the human retinoblastoma cell line WERI-RB revealed the structure consisting of a 226-bp 5'-untranslated region, a  
10 522-bp ORF, and a 2741-bp 3'-untranslated region. The ORF encodes a protein consisting of 173 amino acid residues and there existed one putative transmembrane domain. Figure 38 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein.

15 Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. W26443) among ESTs. However, since they are partial sequences, it can not be judged whether or  
20 not they encode the same protein as the protein of the present invention.

<HP10658> (SEQ ID NOS: 99, 109, and 119)

Determination of the whole base sequence of the cDNA  
25 insert of clone HP10658 obtained from cDNA library of the human fibrosarcoma cell line HT-1080 revealed the structure consisting of a 24-bp 5'-untranslated region, a 228-bp ORF, and a 679-bp 3'-untranslated region. The ORF encodes a protein consisting of 75 amino acid residues and there  
30 existed two putative transmembrane domains. Figure 39 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In

vitro translation resulted in formation of a translation product of 14 kDa or less that was almost identical with the molecular weight of 8,625 predicted from the ORF.

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. T85006) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP10663> (SEQ ID NOS: 100, 110, and 120)

Determination of the whole base sequence of the cDNA insert of clone HP10663 obtained from cDNA library of the human lymphoma cell line U937 revealed the structure consisting of a 67-bp 5'-untranslated region, a 480-bp ORF, and a 576-bp 3'-untranslated region. The ORF encodes a protein consisting of 159 amino acid residues and there existed two putative transmembrane domains. Figure 40 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein.

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA336522) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP03165> (SEQ ID NOS: 121, 131, and 141)

Determination of the whole base sequence of the cDNA insert of clone HP03165 obtained from cDNA library of human

epidermoid carcinoma cell line KB revealed the structure consisting of a 128-bp 5'-untranslated region, a 1911-bp ORF, and a 1195-bp 3'-untranslated region. The ORF encodes a protein consisting of 636 amino acid residues and there  
5 existed a putative secretory signal at the N-terminus. Figure 41 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 61 kDa that was smaller than the  
10 molecular weight of 72,033 predicted from the ORF. Application of the (-3,-1) rule, a method for predicting the cleavage site of the secretory signal sequence, allows to expect that the mature protein starts from serine at position 33.

15 The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the human  $\beta$ -galactosidase (GenBank Protein ID No. AAA51822). Table 28 shows the comparison between amino acid sequences of the human protein of the  
20 present invention (HP) and the human  $\beta$ -galactosidase (GL). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The  
25 both proteins shared a homology of 37.8% in the entire region.



Table 28

[illegible]

HP RNQYIK

GL FVDRPVIGSSVTYDHPSKPVEKRLMPPPPQKNKDSWLDHV

---

5

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA054017) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP03266> (SEQ ID NOS: 122, 132, and 142)

15 Determination of the whole base sequence of the cDNA insert of clone HP03266 obtained from cDNA library of human fibrosarcoma cell line HT-1080 revealed the structure consisting of a 69-bp 5'-untranslated region, a 957-bp ORF, and a 1464-bp 3'-untranslated region. The ORF encodes a protein consisting of 318 amino acid residues and there existed one putative transmembrane domain at the N-terminus. Figure 42 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 34 kDa that was almost identical with the molecular weight of 35,363 predicted from the ORF.

25 The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the Arabidopsis thaliana putative ribitol dehydrogenase (GenBank Protein ID No. AAC23625). Table 29 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the

30

Arabidopsis thaliana putative ribitol dehydrogenase (AT).  
 Therein, the marks of -, \*, and . represent a gap, an amino  
 acid residue identical with that of the protein of the  
 present invention, and an amino acid residue similar to that  
 5 of the protein of the present invention, respectively. The  
 both proteins shared a homology of 39.0% in the region of  
 483 residues other than the N-terminal region.

Table 29

10  
 HP MVELMFPLLLLLLPFLLYMAAPQIRKMLSSGVCTSTVQLPGKVVVVTGANTGIGKETAKE  
 \* . . . . . \* . . . . . \* . . . . .  
 AT MGIYGVMTGKKGKSGFGSASTAEDVTQAIDASHLTAITGGTSGIGLEAARV  
 HP LAQRGARVYLACRDVEKGELVAKEIQTTTGNQQVLVRKLDLSDTKSIRAFAGFLAEKEH  
 15 \*\* \* . . \* . . . . . \* . . . . . \* . . . . . \* . . . . .  
 AT LAMRGAHVIAARNPKAANESKEMILQMPNARVDYLQIDVSSIKSVRSFVDQFLALNVP  
 HP LHVLIINAGVMMCPYSKTADGFEMHIGVNHGHLGHFLLTHLLEKLEK-----ESAPSRIVNV  
 \* . . . . . \* . . . . . \* . . . . . \* . . . . . \* . . . . .  
 AT LNLIINAGVMFCPFKLTEDGIESQFATNHIGHFLLTNLLLDKMKSTARESGVQGRIVNL  
 20 HP SSLAH---HLGRIHFHNLQGEKFYNAGLAYCHSKLANILFTQELARRLKGSG--VTYSV  
 \*\* \* . . \* . . . . . \* . . . . . \* . . . . . \* . . . . . \* . . . . .  
 AT SSIAHTYTYSEGIKFQGINDPAGYSERRAYGQSKLSNLLHSNALSRRQLQEEGVNITINSV  
 HP HPGTVQSELVRHSSFMRWMLFSLF-FIGTPQQAQTSLHLCALTEGLEILSGNHFSDCHV  
 \*\*\* \* . . \* . . . . . \* . . . . . \* . . . . . \* . . . . . \* . . . . .  
 25 AT HPGLVTTNLFYSGFSMKVFRAMTFLFWKNIPQGAATTCYVALHPDLEGVTGKYFGDCNI  
 HP AWVSAQARNETIARRLWDVSCDLLGLPID  
 . \* \* . . . . . \* . . . . . \* . . . . .  
 AT VAPSKFATNNSLADKLWDFSVFLIDSISK

30

Furthermore, the search of the GenBank using the base  
 sequences of the present cDNA has revealed the registration  
 of sequences that shared a homology of 90% or more (for  
 example, Accession No. D17020) among ESTs. However, since

they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

5 <HP03287> (SEQ ID NOS: 123, 133, and 143)

Determination of the whole base sequence of the cDNA insert of clone HP03287 obtained from cDNA library of human thymus revealed the structure consisting of a 83-bp 5'-untranslated region, a 249-bp ORF, and a 1133-bp 3'-untranslated region. The ORF encodes a protein consisting of 82 amino acid residues and there existed one putative transmembrane domain at the N-terminus and one at the C-terminus, respectively. Figure 43 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of high molecular weight.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was similar to the *Schizosaccharomyces pombe* hypothetical protein 9.0kDa (SWISS-PROT Accession No. 013825). Table 30 shows the comparison between amino acid sequences of the human protein of the present invention (HP) and the *Schizosaccharomyces pombe* hypothetical protein 9.0kDa (SP). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention, respectively. The both proteins shared a homology of 45.7% in the entire region.

Table 30

```

HP MAFTLYSILQAALLCVNAIAVLHEERFLKNIGWGTDQGIGGFGE-EPGIKSQMLNLIRSV
    *.. ..* ... **.*.* *.*** .***. .... ***. . .***....***..
SP MFGFGNILYVTLLLLNAVAILSEDRFLGRIGWSQSAAL-GFGDRQDTIKSRILHLIRAI
HP RTVMRVPLIIVNSIAIVLLLLFG
    **** *** .*.*** *..*
SP RTVMTFPLIAINTIVIVYNLVLG

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10

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA853098) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

<HP10665> (SEQ ID NOS: 124, 134, and 144)

20

Determination of the whole base sequence of the cDNA insert of clone HP10665 obtained from cDNA library of human fibrosarcoma cell line HT-1080 revealed the structure consisting of a 31-bp 5'-untranslated region, a 744-bp ORF, and a 142-bp 3'-untranslated region. The ORF encodes a protein consisting of 247 amino acid residues and there existed a putative secretory signal at the N-terminus. Figure 44 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 28 kDa that was somewhat larger than the molecular weight of 25,320 predicted from the ORF. In this case, the addition of a microsome led to the formation

25

**30**

of a product of 27 kDa. Application of the (-3,-1) rule, a method for predicting the cleavage site of the secretory signal sequence, allows to expect that the mature protein starts from aspartic acid at position 26.

5        Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA055367) among ESTs. However, since they are partial sequences, it can not be judged whether or  
10       not they encode the same protein as the protein of the present invention.

<HP10669> (SEQ ID NOS: 125, 135, and 145)

15       Determination of the whole base sequence of the cDNA insert of clone HP10669 obtained from cDNA library of human retinoblastoma cell line WERI-RB revealed the structure consisting of a 73-bp 5'-untranslated region, a 621-bp ORF, and a 612-bp 3'-untranslated region. The ORF encodes a protein consisting of 206 amino acid residues and there  
20       existed one putative transmembrane domain. Figure 45 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein.

25       Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AF086533) among ESTs. However, since they are partial sequences, it can not be judged whether or  
30       not they encode the same protein as the protein of the present invention.

<HP10670> (SEQ ID NOS: 126, 136, and 146)

Determination of the whole base sequence of the cDNA

insert of clone HP10670 obtained from cDNA library of human retinoblastoma cell line WERI-RB revealed the structure consisting of a 117-bp 5'-untranslated region, a 1299-bp ORF, and a 606-bp 3'-untranslated region. The ORF encodes a  
5 protein consisting of 432 amino acid residues and there existed seven putative transmembrane domains. Figure 46 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein.

The search of the protein data base using the amino  
10 acid sequence of the present protein revealed that the protein was similar to the *Caenorhabditis elegans* hypothetical protein CELM03F8.2 (GenBank Protein ID No. AAB65910). Table 31 shows the comparison between amino acid sequences of the human protein of the present invention (HP)  
15 and the *Caenorhabditis elegans* hypothetical protein CELM03F8.2 (CE). Therein, the marks of -, \*, and . represent a gap, an amino acid residue identical with that of the protein of the present invention, and an amino acid residue similar to that of the protein of the present invention,  
20 respectively. The both proteins shared a homology of 39.6% in the N-terminal region of 376 residues.

Table 31

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	HP	MDARWWAVVVLAAFPSLGAGGETPEAPPESWTQLWFFRFVNAAGYASFMVPGYLLVQYF
		. . . . . ** . . * . . . . ** . . * . . *
5	CE	MDRSIMPIDSPARDKPPD--ELVWPLRLFLILLGYSTVATPAAILIYV
	HP	RRKNYLETGRGLCFPLVKACVFGNEPKASDEVPLA---PRTEAAETTPMW-----QALKL
		** . . . . . * . . . . . * . . . . . * . . . . . *
	CE	RRNRHAFETPYLSIRLLLR--FAVGNPEYQLIPTGEKQARKENDSIPQTRAQCINVIILL
	HP	LFCATGLQVSYLTWGVLQERVMTSR--GATATSPGERFTDSQFLVLMNRVLALIVA--GL
10	**	* . . . . . * . . . . . * . . . . . * . . . . . *
	CE	LFFFSGIQVTLVAMGVLQERIITRGYRRSDQLEVEDKFGETQFLIFCNRIVALVLSMIL
	HP	SCVLCKQPRHGAPMYRYSFASLSNVLSSWCQYEALKFVSFPTQVLAKASKVIPVMLMGKL
		. . . . . * . . . . . * . . . . . * . . . . . *
	CE	AKDWTQKPPHPPLYVHSYTSFSNTISSWCQYEALKYVSFPTQTICKASKVVVTMLMGR
15	HP	VSRRSYEHWEYLTATLISIGVSMFLSSGPEPRSSPAT--TLGGLILLAGYIAFDSFTSN
		* . . . . . * . . . . . * . . . . . * . . . . . *
	CE	VRGQRYSWFEYCGCTIAFGASLFLSSSSKGAGSTITYTSFGMILMAGYLLFDAFTLN
	HP	WQDALFAYK--MSSVQMMFGVNFSSCLFTVGSLLLEQGALLEGTRFMGRHSEFAAHALLS
		** . . . . . * . . . . . * . . . . . * . . . . . *
20	CE	WQKALFDTKPKVSKYQMMFGVNFSSAILCAVSLIEQGLWSSIKFGAEHVDFSRDVFLLS
	HP	ICSACQLFIFYTIGQFGAAVFTIIMTLRQAFAILLSCILYGHTVTVVGGLGVAVVFAAL
		. . . * . . . * . . . * . . . * . . . * . . . *
	CE	LSGAIGQIFIYSTIERFGPIVFAVIMTIRQIFIRNTLIRAEDHRGVEMAPPPPEPFRLK
	HP	LLRVYARGRLKQRGKKAVPVESPVQKV
25		
	CE	FLSMIIAVIHI

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30 Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. Z46196) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the



present invention.

<HP10671> (SEQ ID NOS: 127, 137, and 147)

Determination of the whole base sequence of the cDNA  
5 insert of clone HP10671 obtained from cDNA library of human  
thymus revealed the structure consisting of a 74-bp 5'-  
untranslated region, a 921-bp ORF, and a 232-bp 3'-  
untranslated region. The ORF encodes a protein consisting of  
306 amino acid residues and there existed a putative  
10 secretory signal at the N-terminus and one putative  
transmembrane domain at the intermediate region. Figure 47  
depicts the hydrophobicity/hydrophilicity profile, obtained  
by the Kyte-Doolittle method, of the present protein.

Furthermore, the search of the GenBank using the base  
15 sequences of the present cDNA has revealed the registration  
of sequences that shared a homology of 90% or more (for  
example, Accession No. AA357141) among ESTs. However, since  
they are partial sequences, it can not be judged whether or  
not they encode the same protein as the protein of the  
20 present invention.

<HP10673> (SEQ ID NOS: 128, 138, and 148)

Determination of the whole base sequence of the cDNA  
insert of clone HP10673 obtained from cDNA library of the  
25 human thymus revealed the structure consisting of a 203-bp  
5'-untranslated region, a 1668-bp ORF, and a 339-bp 3'-  
untranslated region. The ORF encodes a protein consisting of  
555 amino acid residues and there existed one putative  
transmembrane domain. Figure 48 depicts the  
30 hydrophobicity/hydrophilicity profile, obtained by the Kyte-  
Doolittle method, of the present protein. In vitro  
translation resulted in formation of a translation product

of 65 kDa that was somewhat larger than the molecular weight of 61,781 predicted from the ORF.

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. R96413) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

10

<HP10675> (SEQ ID NOS: 129, 139, and 149)

Determination of the whole base sequence of the cDNA insert of clone HP10675 obtained from cDNA library of the human thymus revealed the structure consisting of a 92-bp 5'-untranslated region, a 753-bp ORF, and a 648-bp 3'-untranslated region. The ORF encodes a protein consisting of 250 amino acid residues and there existed at least one putative transmembrane domain. Figure 49 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein.

20

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA356139) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

25

<HP10683> (SEQ ID NOS: 130, 140, and 150)

Determination of the whole base sequence of the cDNA insert of clone HP10683 obtained from cDNA library of the human lymphoma cell line U937 revealed the structure

30

consisting of a 25-bp 5'-untranslated region, a 525-bp ORF, and a 714-bp 3'-untranslated region. The ORF encodes a protein consisting of 174 amino acid residues and there existed one putative transmembrane domain. Figure 50 depicts the hydrophobicity/hydrophilicity profile, obtained by the Kyte-Doolittle method, of the present protein. In vitro translation resulted in formation of a translation product of 22 kDa that was somewhat larger than the molecular weight of 19,572 predicted from the ORF. In this case, the addition of a microsome led to the formation of a product of 24 kDa to which sugar chains are presumably attached. In addition, there exist in the amino acid sequence of this protein one site at which N-glycosylation may occur (Asn-Ile-Thr at position 27).

Furthermore, the search of the GenBank using the base sequences of the present cDNA has revealed the registration of sequences that shared a homology of 90% or more (for example, Accession No. AA482321) among ESTs. However, since they are partial sequences, it can not be judged whether or not they encode the same protein as the protein of the present invention.

#### INDUSTRIAL APPLICABILITY

The present invention provides human proteins having hydrophobic domains, DNAs encoding these proteins, and expression vectors for these DNAs as well as eukaryotic cells expressing these DNAs. Since all of the proteins of the present invention are secreted or exist in the cell membrane, they are considered to be proteins controlling the proliferation and/or the differentiation of the cells. Accordingly, the proteins of the present invention can be employed as pharmaceuticals such as carcinostatic agents

which act to control the proliferation and/or the differentiation of the cells, or as antigens for preparing antibodies against these proteins. The DNAs of the present invention can be utilized as probes for the genetic  
5 diagnosis and gene sources for the gene therapy. Furthermore, the DNAs can be utilized for large-scale expression of these proteins. Cells into which these genes are introduced to express these proteins, can be utilized for detection of the corresponding receptors or ligands, screening of novel small  
10 molecule pharmaceuticals and the like.

The present invention also provides genes corresponding to the polynucleotide sequences disclosed herein. "Corresponding genes" are the regions of the genome that are transcribed to produce the mRNAs from which cDNA  
15 polynucleotide sequences are derived and may include contiguous regions of the genome necessary for the regulated expression of such genes. Corresponding genes may therefore include but are not limited to coding sequences, 5' and 3' untranslated regions, alternatively spliced exons, introns,  
20 promoters, enhancers, and silencer or suppressor elements. The corresponding genes can be isolated in accordance with known methods using the sequence information disclosed herein. Such methods include the preparation of probes or primers from the disclosed sequence information for  
25 identification and/or amplification of genes in appropriate genomic libraries or other sources of genomic materials. An "isolated gene" is a gene that has been separated from the adjacent coding sequences, if any, present in the genome of the organism from which the gene was isolated.

30 Organisms that have enhanced, reduced, or modified expression of the gene(s) corresponding to the polynucleotide sequences disclosed herein are provided. The

desired change in gene expression can be achieved through the use of antisense polynucleotides or ribozymes that bind and/or cleave the mRNA transcribed from the gene (Albert and Morris, 1994, Trends Pharmacol. Sci. 15(7): 250-254; 5 Lavarosky et al., 1997, Biochem. Mol. Med. 62(1): 11-22; and Hampel, 1998, Prog. Nucleic Acid Res. Mol. Biol. 58: 1-39; all of which are incorporated by reference herein). Transgenic animals that have multiple copies of the gene(s) corresponding to the polynucleotide sequences disclosed 10 herein, preferably produced by transformation of cells with genetic constructs that are stably maintained within the transformed cells and their progeny, are provided. Transgenic animals that have modified genetic control regions that increase or reduce gene expression levels, or 15 that change temporal or spatial patterns of gene expression, are also provided (see European Patent No. 0 649 464 B1, incorporated by reference herein). In addition, organisms are provided in which the gene(s) corresponding to the polynucleotide sequences disclosed herein have been 20 partially or completely inactivated, through insertion of extraneous sequences into the corresponding gene(s) or through deletion of all or part of the corresponding gene(s). Partial or complete gene inactivation can be accomplished through insertion, preferably followed by imprecise excision, 25 of transposable elements (Plasterk, 1992, Bioessays 14(9): 629-633; Zwaal et al., 1993, Proc. Natl. Acad. Sci. USA 90(16): 7431-7435; Clark et al., 1994, Proc. Natl. Acad. Sci. USA 91(2): 719-722; all of which are incorporated by reference herein), or through homologous recombination, 30 preferably detected by positive/negative genetic selection strategies (Mansour et al., 1988, Nature 336: 348-352; U.S. Patent Nos. 5,464,764; 5,487,992; 5,627,059; 5,631,153;

5,614, 396; 5,616,491; and 5,679,523; all of which are incorporated by reference herein). These organisms with altered gene expression are preferably eukaryotes and more preferably are mammals. Such organisms are useful for the development of non-human models for the study of disorders involving the corresponding gene(s), and for the development of assay systems for the identification of molecules that interact with the protein product(s) of the corresponding gene(s). Where the protein of the present invention is membrane-bound (e.g., is a receptor), the present invention also provides for soluble forms of such protein. In such forms part or all of the intracellular and transmembrane domains of the protein are deleted such that the protein is fully secreted from the cell in which it is expressed. The intracellular and transmembrane domains of proteins of the invention can be identified in accordance with known techniques for determination of such domains from sequence information.

Proteins and protein fragments of the present invention include proteins with amino acid sequence lengths that are at least 25% (more preferably at least 50%, and most preferably at least 75%) of the length of a disclosed protein and have at least 60% sequence identity (more preferably, at least 75% identity; most preferably at least 90% or 95% identity) with that disclosed protein, where sequence identity is determined by comparing the amino acid sequences of the proteins when aligned so as to maximize overlap and identity while minimizing sequence gaps. Also included in the present invention are proteins and protein fragments that contain a segment preferably comprising 8 or more (more preferably 20 or more, most preferably 30 or more) contiguous amino acids that shares at least 75%

sequence identity (more preferably, at least 85% identity; most preferably at least 95% identity) with any such segment of any of the disclosed proteins.

Species homologs of the disclosed polynucleotides and proteins are also provided by the present invention. As used  
5 herein, a "species homologue" is a protein or polynucleotide with a different species of origin from that of a given protein or polynucleotide, but with significant sequence similarity to the given protein or polynucleotide, as  
10 determined by those of skill in the art. Species homologs may be isolated and identified by making suitable probes or primers from the sequences provided herein and screening a suitable nucleic acid source from the desired species.

The invention also encompasses allelic variants of the  
15 disclosed polynucleotides or proteins; that is, naturally-occurring alternative forms of the isolated polynucleotide which also encode proteins which are identical, homologous, or related to that encoded by the polynucleotides.

The invention also includes polynucleotides with  
20 sequences complementary to those of the polynucleotides disclosed herein.

The present invention also includes polynucleotides capable of hybridizing under reduced stringency conditions, more preferably stringent conditions, and most preferably  
25 highly stringent conditions, to polynucleotides described herein. Examples of stringency conditions are shown in the Table 32 below: highly stringent conditions are those that are at least as stringent as, for example, conditions A-F; stringent conditions are at least as stringent as, for  
30 example, conditions G-L; and reduced stringency conditions are at least as stringent as, for example, conditions M-R.

Table 32

Stringency Condition	Polynucleotide Hybrid	Hybrid Length (bp) <sup>‡</sup>	Hybridization Temperature and Buffer <sup>†</sup>	Wash Temperature and Buffer <sup>†</sup>
A	DNA : DNA	≥50	65°C; 1×SSC -or- 42°C; 1×SSC, 50% formamide	65°C; 0.3×SSC
B	DNA : DNA	<50	T <sub>B</sub> <sup>*</sup> ; 1×SSC	T <sub>B</sub> <sup>*</sup> ; 1×SSC
C	DNA : RNA	≥50	67°C; 1×SSC -or- 45°C; 1×SSC, 50% formamide	67°C; 0.3×SSC
D	DNA : RNA	<50	T <sub>D</sub> <sup>*</sup> ; 1×SSC	T <sub>D</sub> <sup>*</sup> ; 1×SSC
E	RNA : RNA	≥50	70°C; 1×SSC -or- 50°C; 1×SSC, 50% formamide	70°C; 0.3×SSC
F	RNA : RNA	<50	T <sub>F</sub> <sup>*</sup> ; 1×SSC	T <sub>F</sub> <sup>*</sup> ; 1×SSC
G	DNA : DNA	≥50	65°C; 4×SSC -or- 42°C; 4×SSC, 50% formamide	65°C; 1×SSC
H	DNA : DNA	<50	T <sub>H</sub> <sup>*</sup> ; 4×SSC	T <sub>H</sub> <sup>*</sup> ; 4×SSC
I	DNA : RNA	≥50	67°C; 4×SSC -or- 45°C; 4×SSC, 50% formamide	67°C; 1×SSC
J	DNA : RNA	<50	T <sub>J</sub> <sup>*</sup> ; 4×SSC	T <sub>J</sub> <sup>*</sup> ; 4×SSC
K	RNA : RNA	≥50	70°C; 4×SSC -or- 50°C; 4×SSC, 50% formamide	67°C; 1×SSC
L	RNA : RNA	<50	T <sub>L</sub> <sup>*</sup> ; 2×SSC	T <sub>L</sub> <sup>*</sup> ; 2×SSC
M	DNA : DNA	≥50	50°C; 4×SSC -or- 40°C; 6×SSC, 50% formamide	50°C; 2×SSC
N	DNA : DNA	<50	T <sub>N</sub> <sup>*</sup> ; 6×SSC	T <sub>N</sub> <sup>*</sup> ; 6×SSC
O	DNA : RNA	≥50	55°C; 4×SSC -or- 42°C; 6×SSC, 50% formamide	55°C; 2×SSC
P	DNA : RNA	<50	T <sub>P</sub> <sup>*</sup> ; 6×SSC	T <sub>P</sub> <sup>*</sup> ; 6×SSC
Q	RNA : RNA	≥50	60°C; 4×SSC -or- 45°C; 6×SSC, 50% formamide	60°C; 2×SSC
R	RNA : RNA	<50	T <sub>R</sub> <sup>*</sup> ; 4×SSC	T <sub>R</sub> <sup>*</sup> ; 4×SSC



‡ : The hybrid length is that anticipated for the hybridized region(s) of the hybridizing polynucleotides. When hybridizing a polynucleotide to a target polynucleotide of unknown sequence, the hybrid length is assumed to be that of the hybridizing polynucleotide. When polynucleotides of known sequence are hybridized, the hybrid length can be determined by aligning the sequences of the polynucleotides and identifying the region or regions of optimal sequence complementarity.

† : SSPE (1×SSPE is 0.15M NaCl, 10mM NaH<sub>2</sub>PO<sub>4</sub>, and 1.25mM EDTA, pH7.4) can be substituted for SSC (1×SSC is 0.15M NaCl and 15mM sodium citrate) in the hybridization and wash buffers; washes are performed for 15 minutes after hybridization is complete.

\*T<sub>B</sub> - T<sub>R</sub> : The hybridization temperature for hybrids anticipated to be less than 50 base pairs in length should be 5-10°C less than the melting temperature (T<sub>m</sub>) of the hybrid, where T<sub>m</sub> is determined according to the following equations. For hybrids less than 18 base pairs in length, T<sub>m</sub>(°C)=2(# of A + T bases) + 4(# of G + C bases). For hybrids between 18 and 49 base pairs in length, T<sub>m</sub>(°C)=81.5 + 16.6(log<sub>10</sub>[Na<sup>+</sup>]) + 0.41 (%G+C) · (600/N), where N is the number of bases in the hybrid, and [Na<sup>+</sup>] is the concentration of sodium ions in the hybridization buffer ([Na<sup>+</sup>] for 1×SSC=0.165M).

20

Additional examples of stringency conditions for polynucleotide hybridization are provided in Sambrook, J., E.F. Fritsch, and T. Maniatis, 1989, Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, chapters 9 and 11, and Current Protocols in Molecular Biology, 1995, F.M. Ausubel et al., eds., John Wiley & Sons, Inc., sections 2.10 and 6.3-6.4, incorporated herein by reference.

Preferably, each such hybridizing polynucleotide has a length that is at least 25% (more preferably at least 50%, and most preferably at least 75%) of the length of the polynucleotide of the present invention to which it hybridizes, and has at least 60% sequence identity (more preferably, at least 75% identity; most preferably at least 90% or 95% identity) with the polynucleotide of the present invention to which it hybridizes, where sequence identity is determined by comparing the sequences of the hybridizing

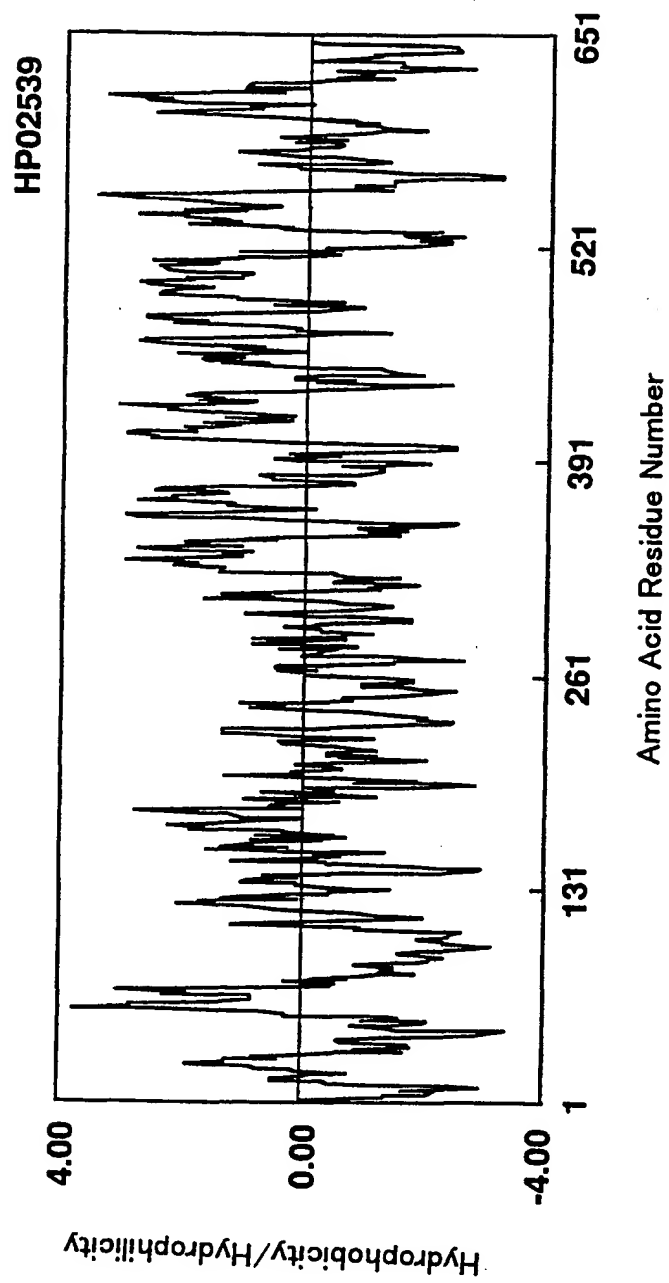
polynucleotides when aligned so as to maximize overlap and identity while minimizing sequence gaps.

## CLAIMS

1. A protein comprising any one of an amino acid sequence selected from the group consisting of SEQ ID NOS: 1 to 10, 31 to 40, 61 to 70, 91 to 100, and 121 to 130.  
5
2. An isolated DNA encoding the protein according to Claim 1.
3. An isolated cDNA comprising any one of a base sequence selected from the group consisting of SEQ ID NOS: 11 to 20, 41 to 50, 71 to 80, 101 to 110, and 131 to 140.  
10
4. The cDNA according to Claim 3 consisting of any one of a base sequence selected from the group consisting of SEQ ID NOS: 21 to 30, 51 to 60, 81 to 90, 111 to 120, and 141 to 150.
- 15 5. An expression vector that is capable of expressing the DNA according to any one of Claim 2 to Claim 4 by in vitro translation or in eukaryotic cells.
6. A transformed eukaryotic cell that is capable of expressing the DNA according to any one of Claim 2 to Claim 4 and of producing the protein according to Claim 1.  
20

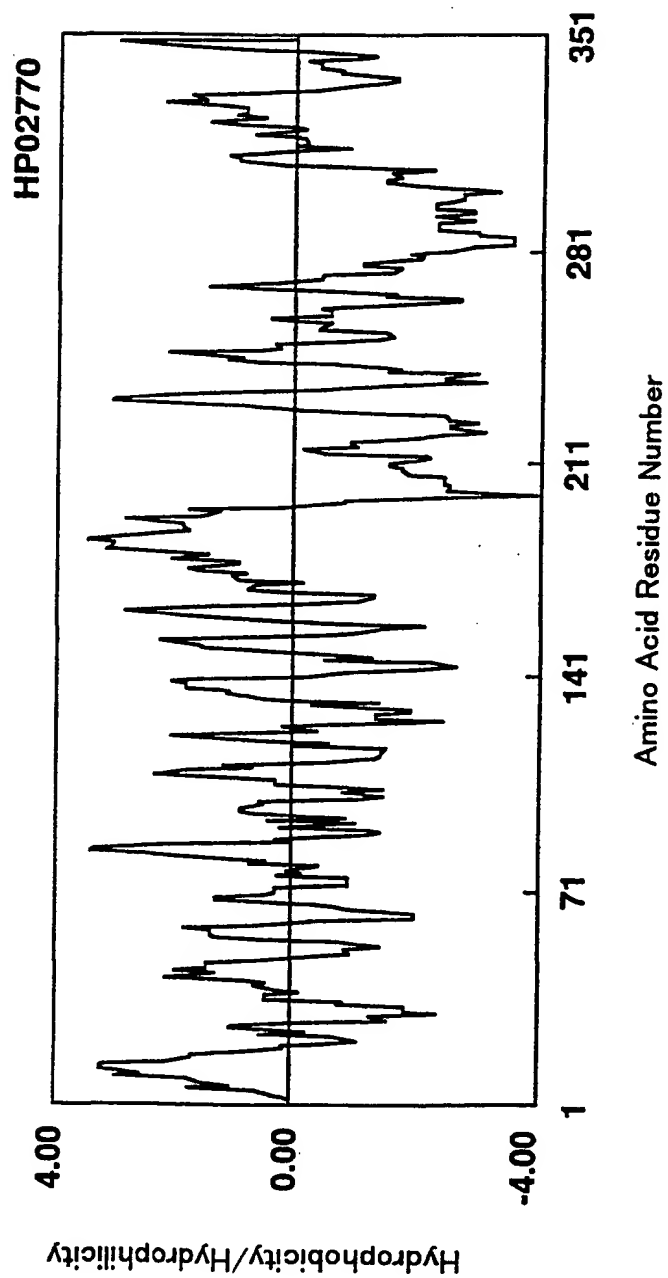
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Fig.1



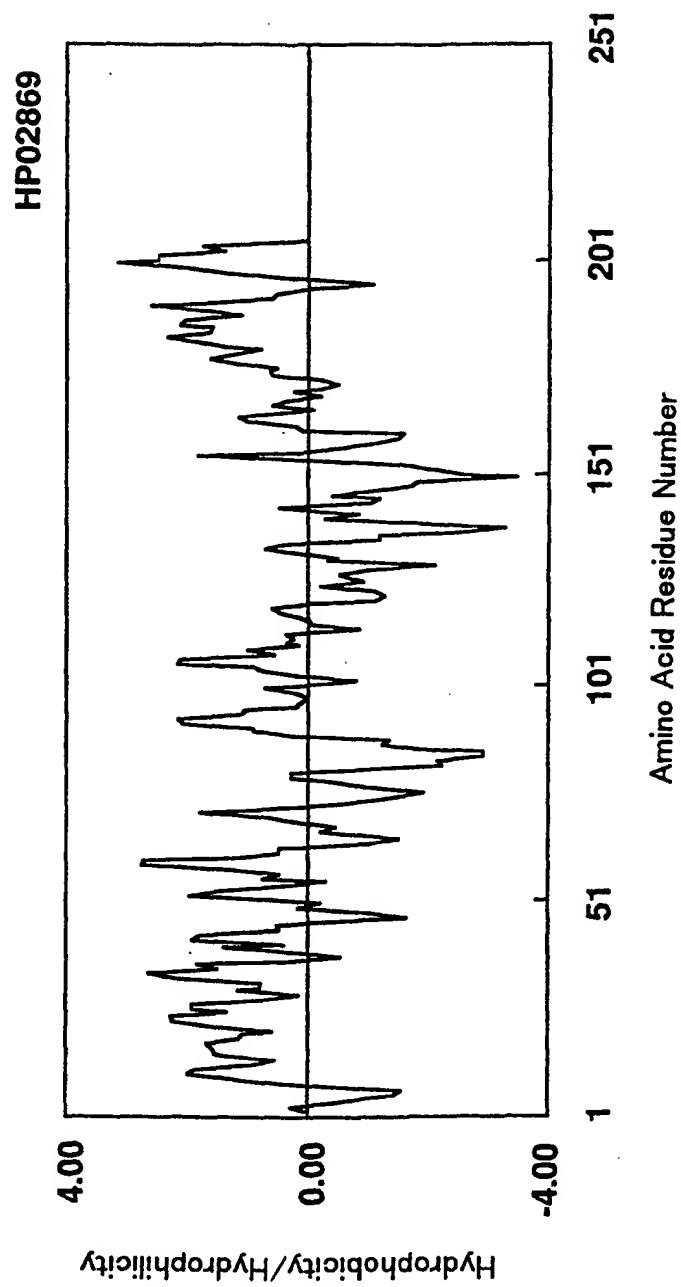
2/50

Fig.2



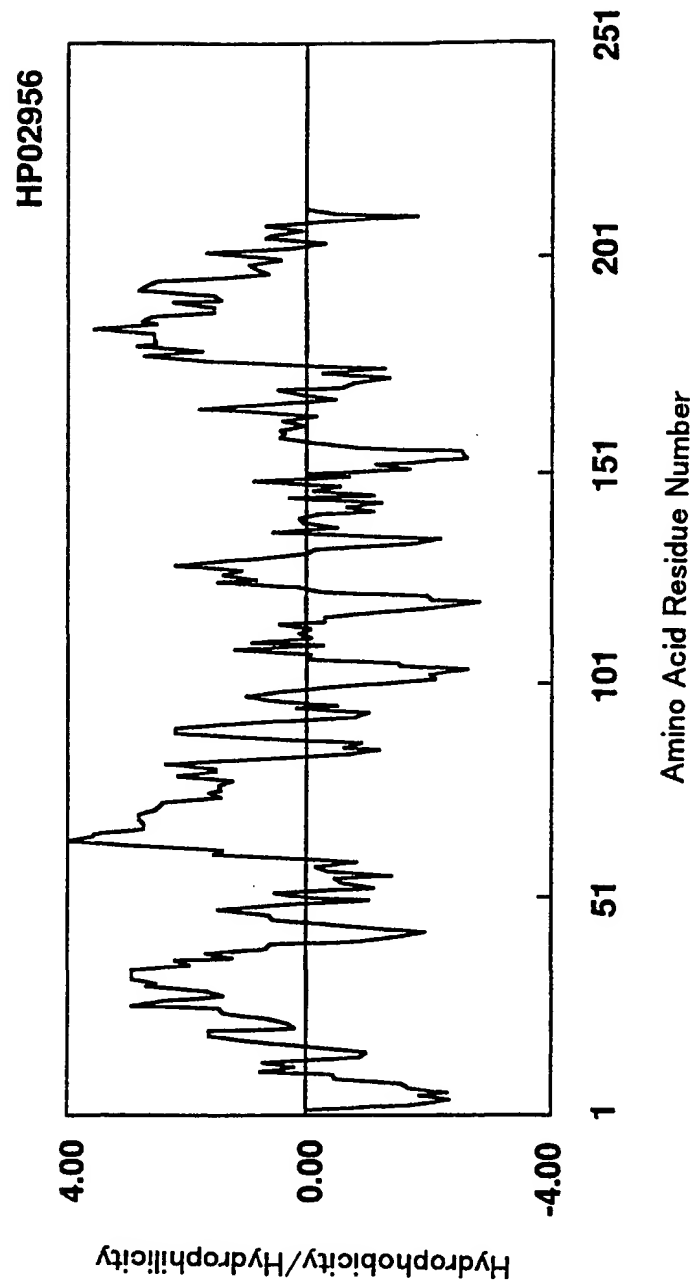
3/50

Fig. 3



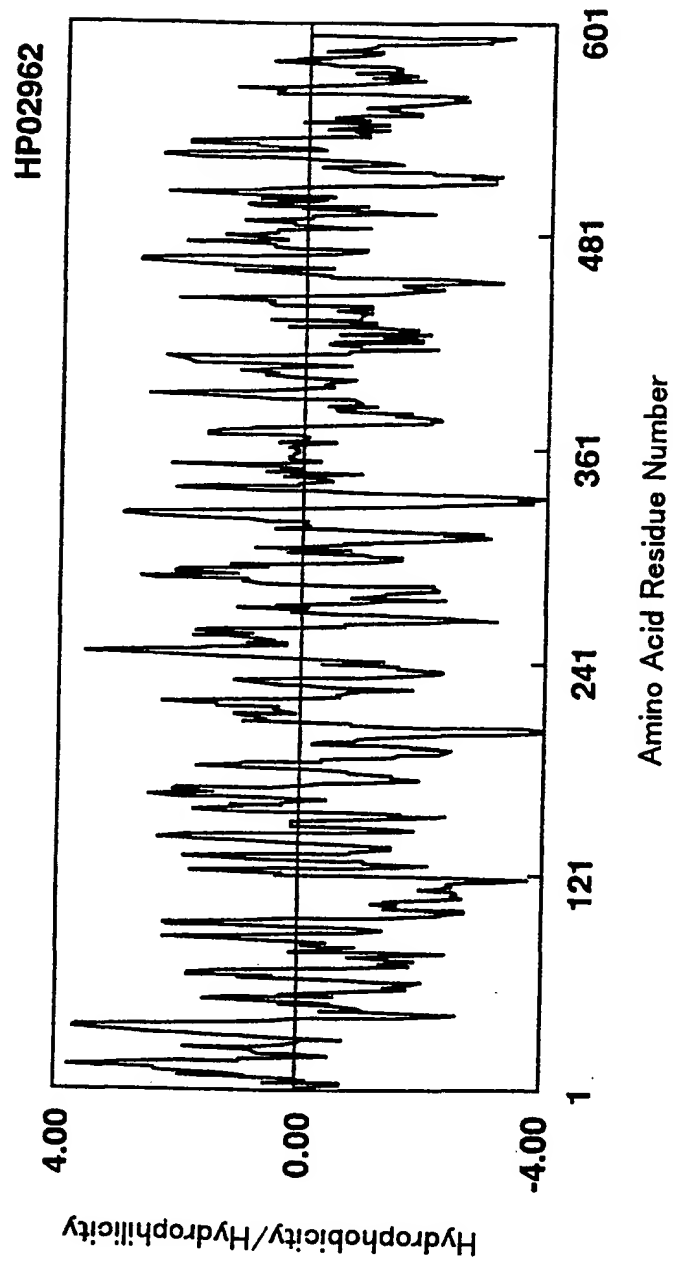
4/50

Fig.4



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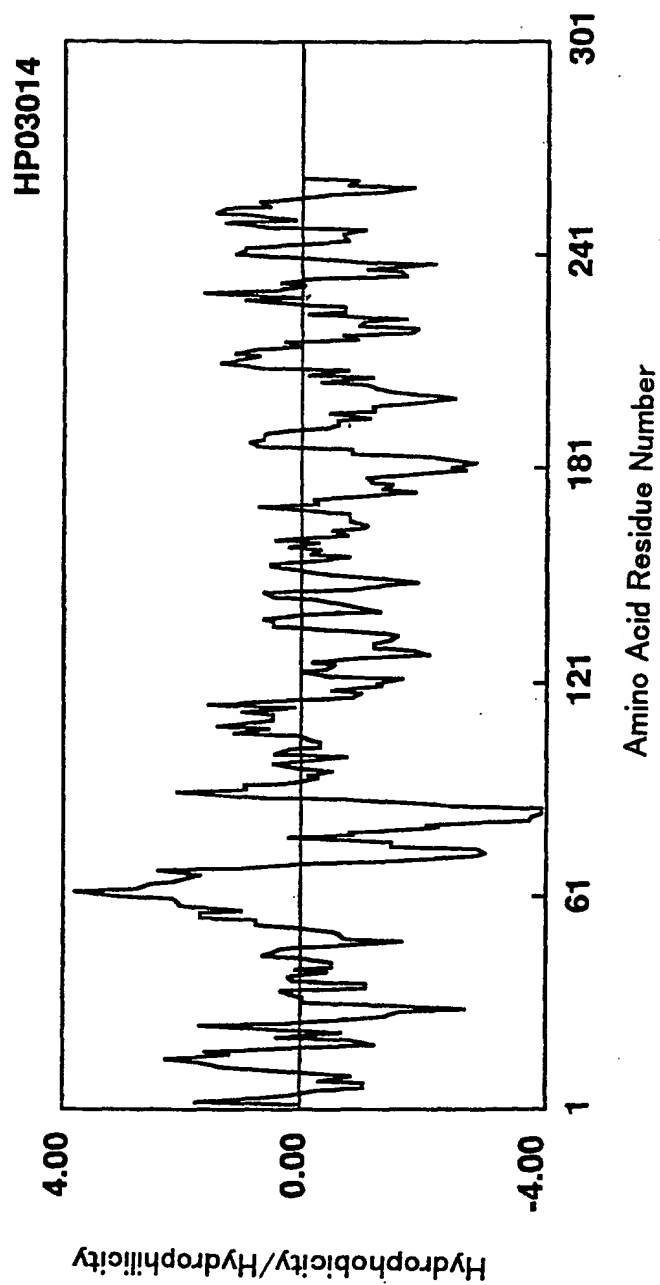
Fig.5





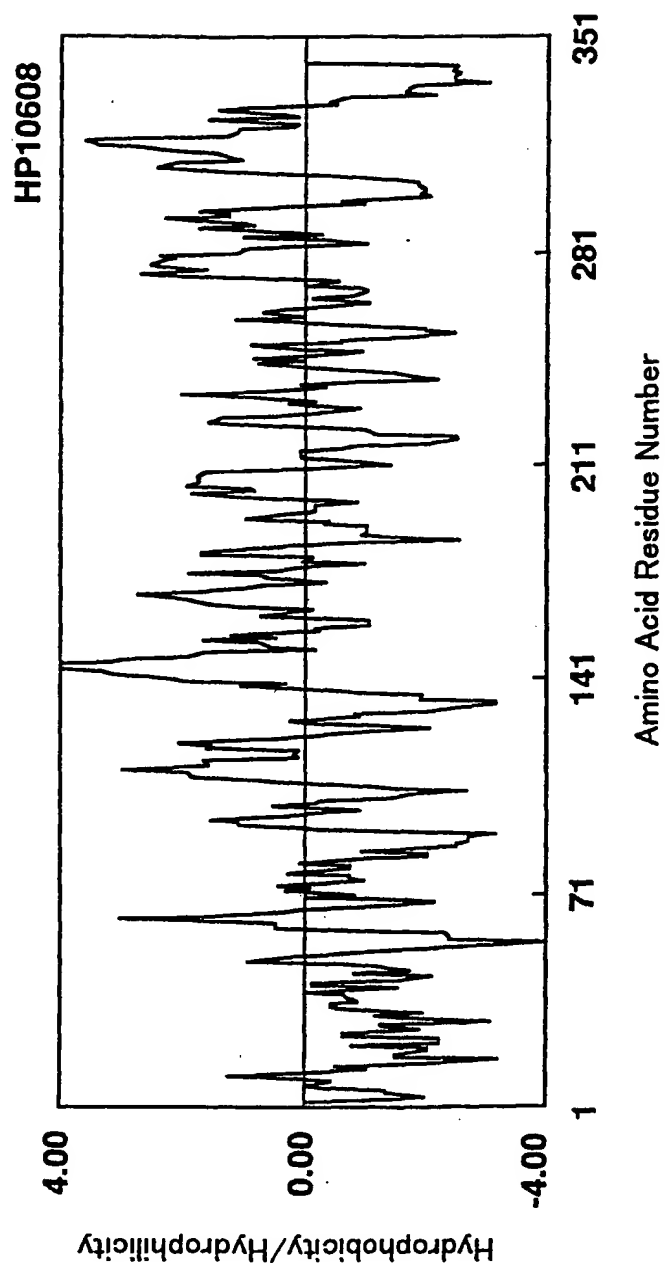
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Fig.6



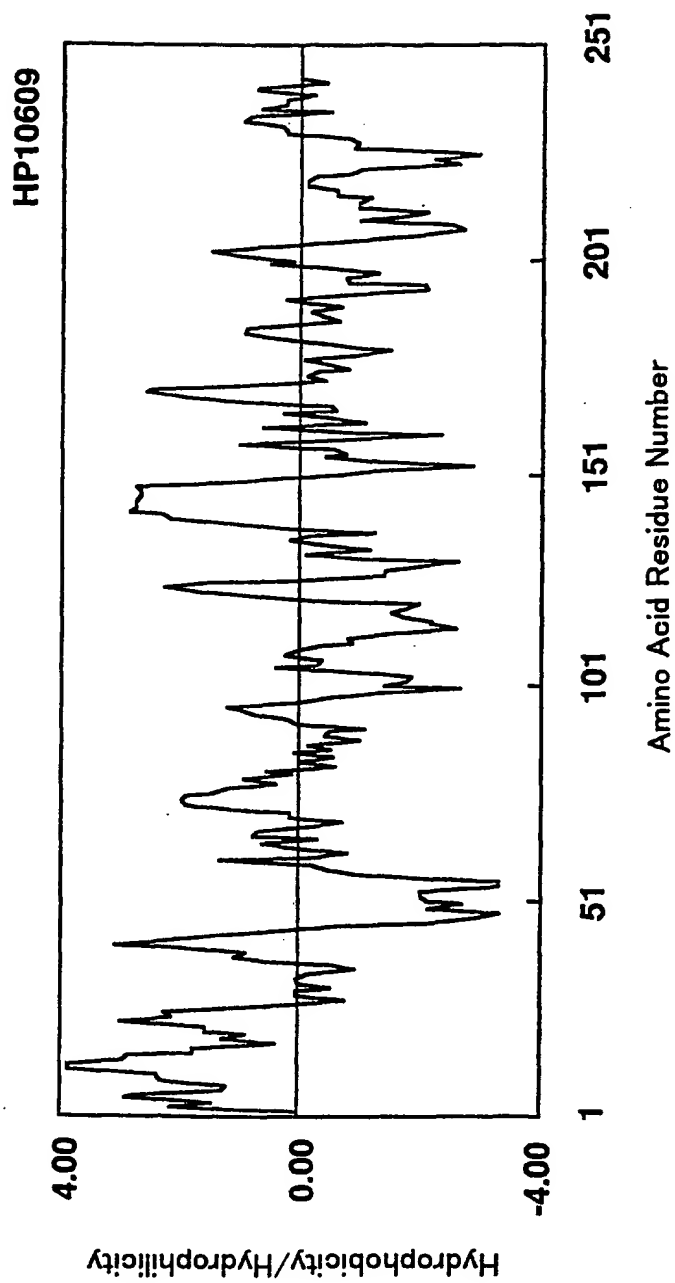
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Fig.7



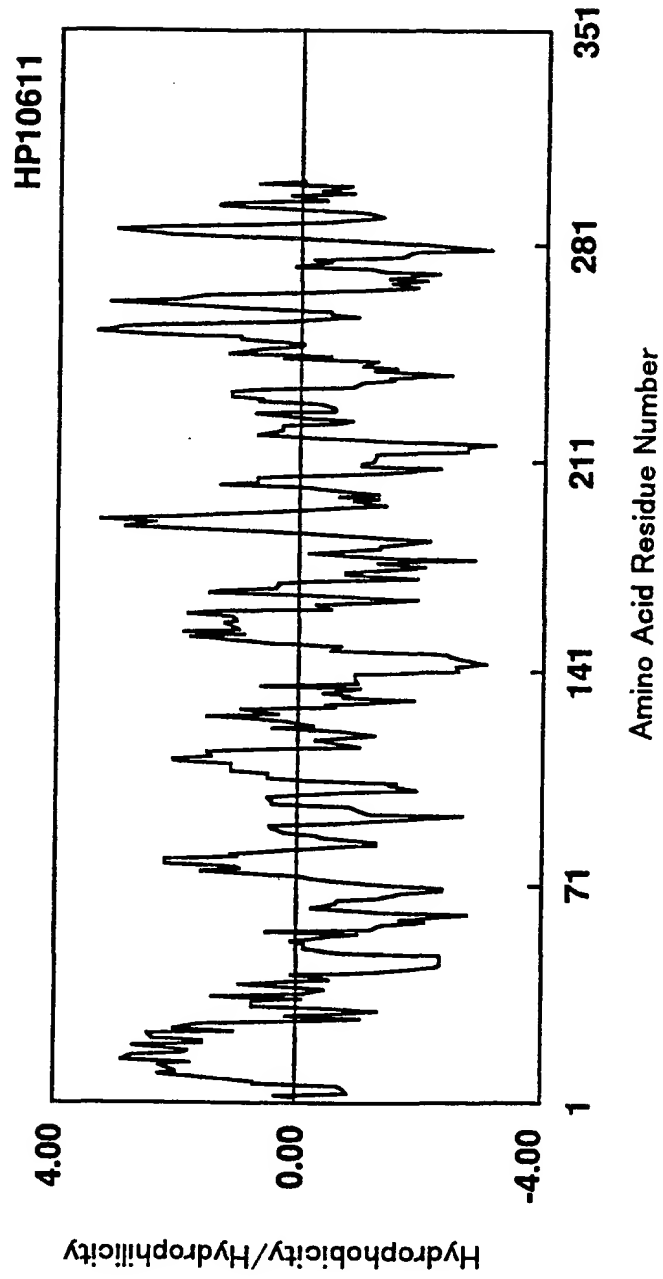
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Fig.8



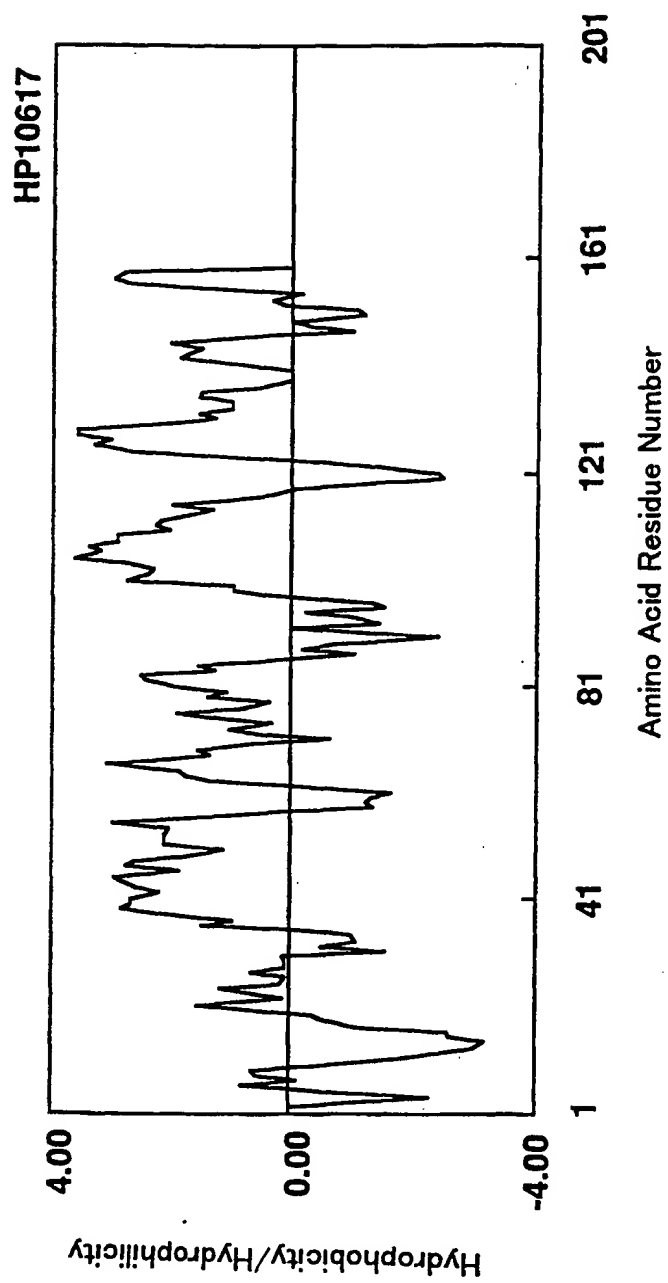
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Fig.9

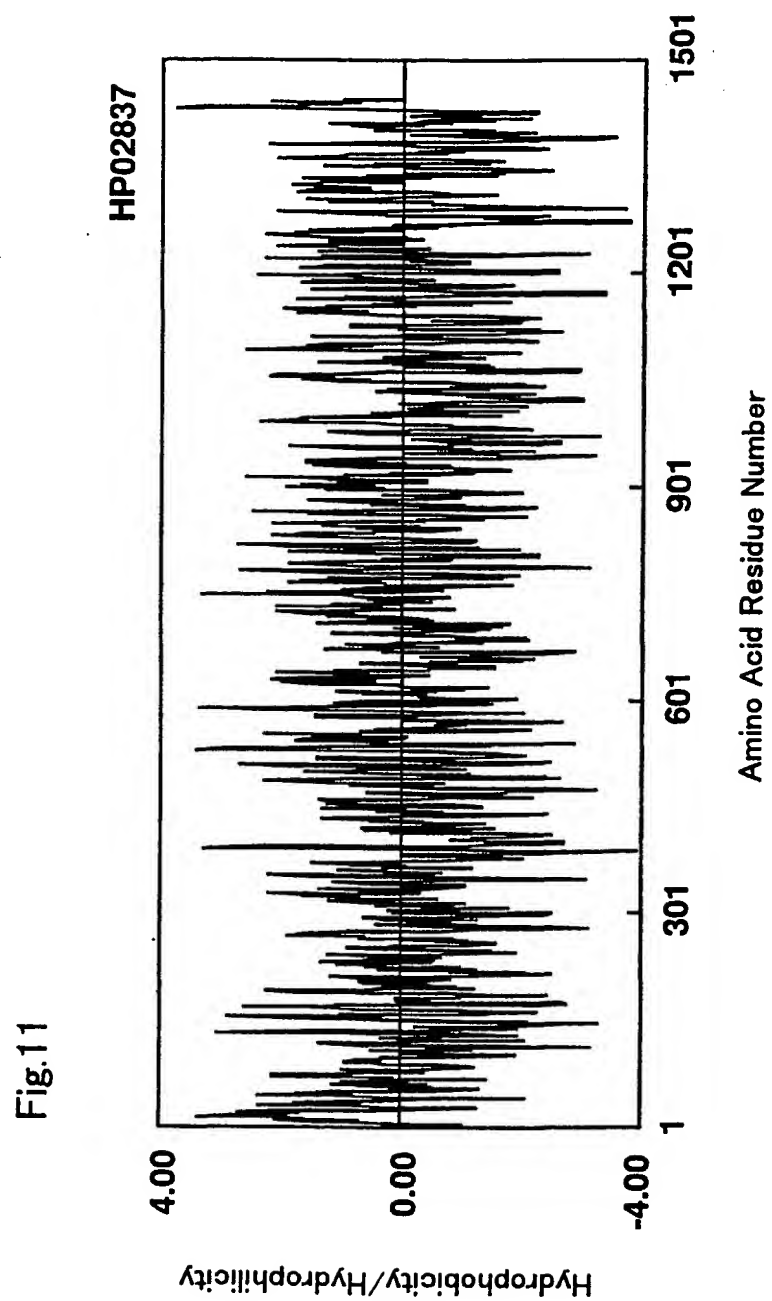


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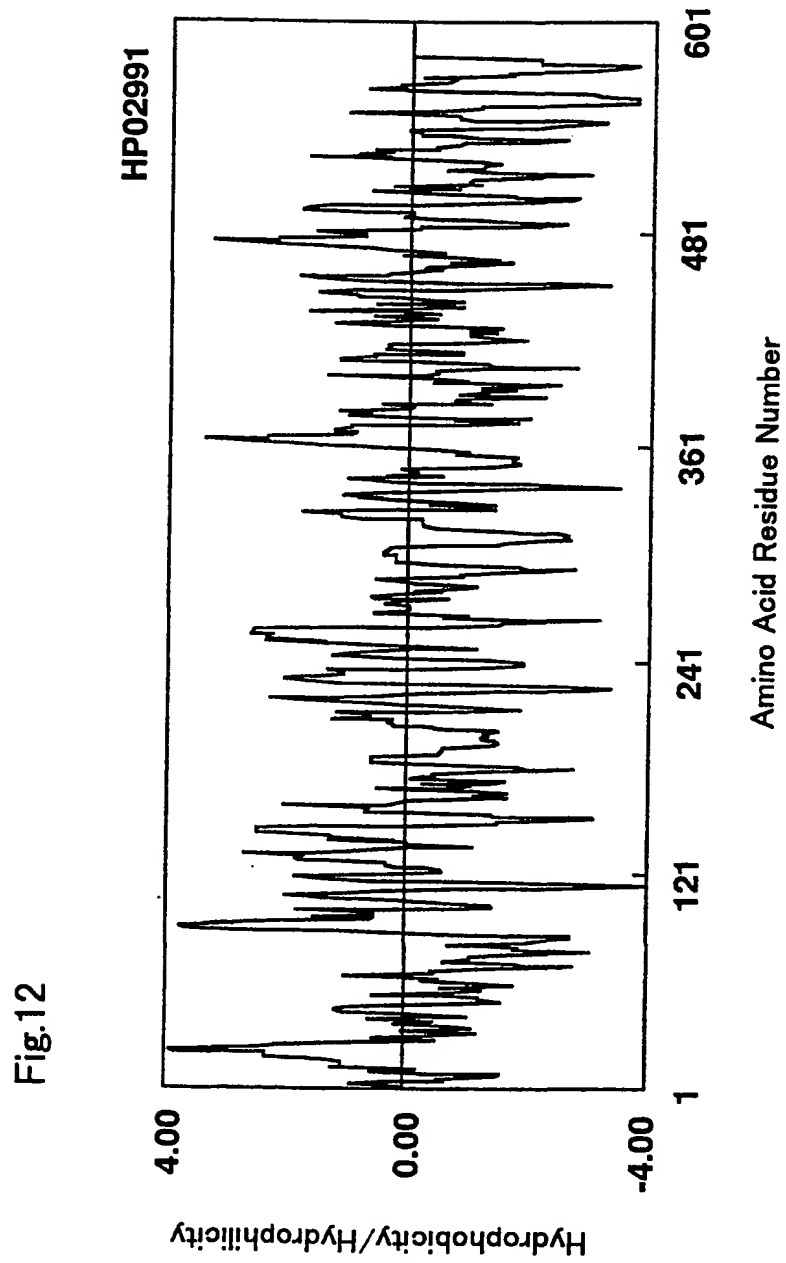
Fig.10



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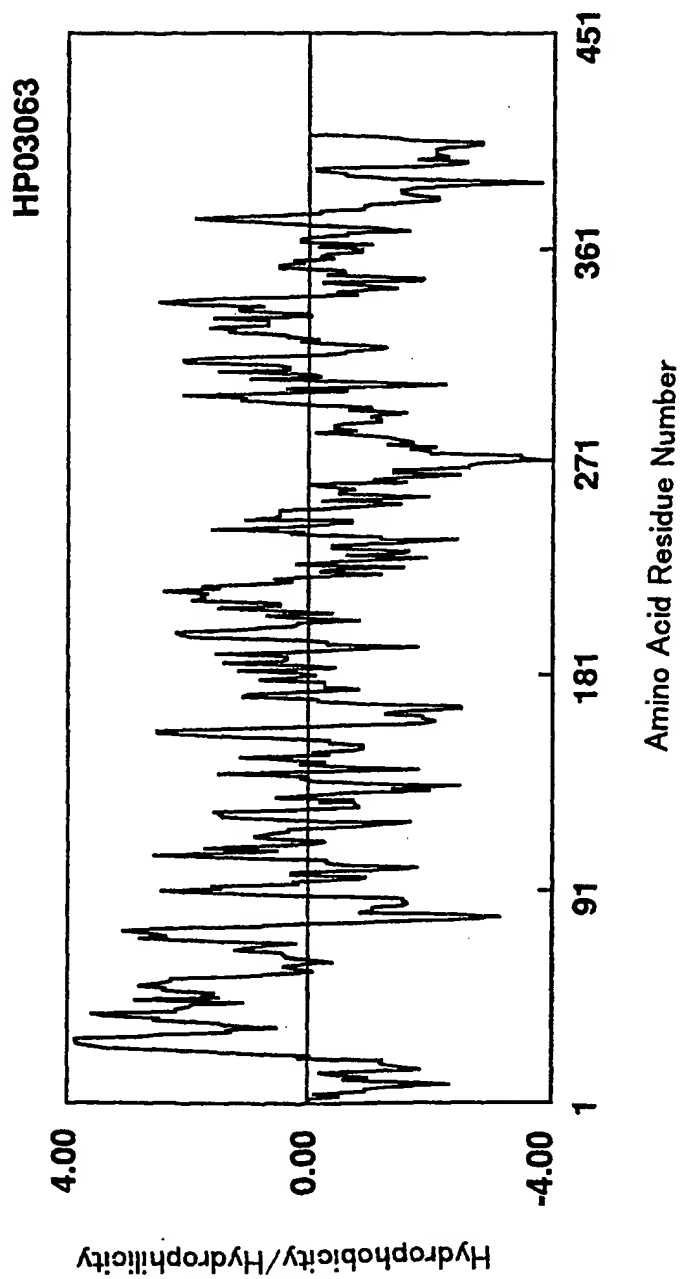


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13/50

Fig.13





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Fig.14

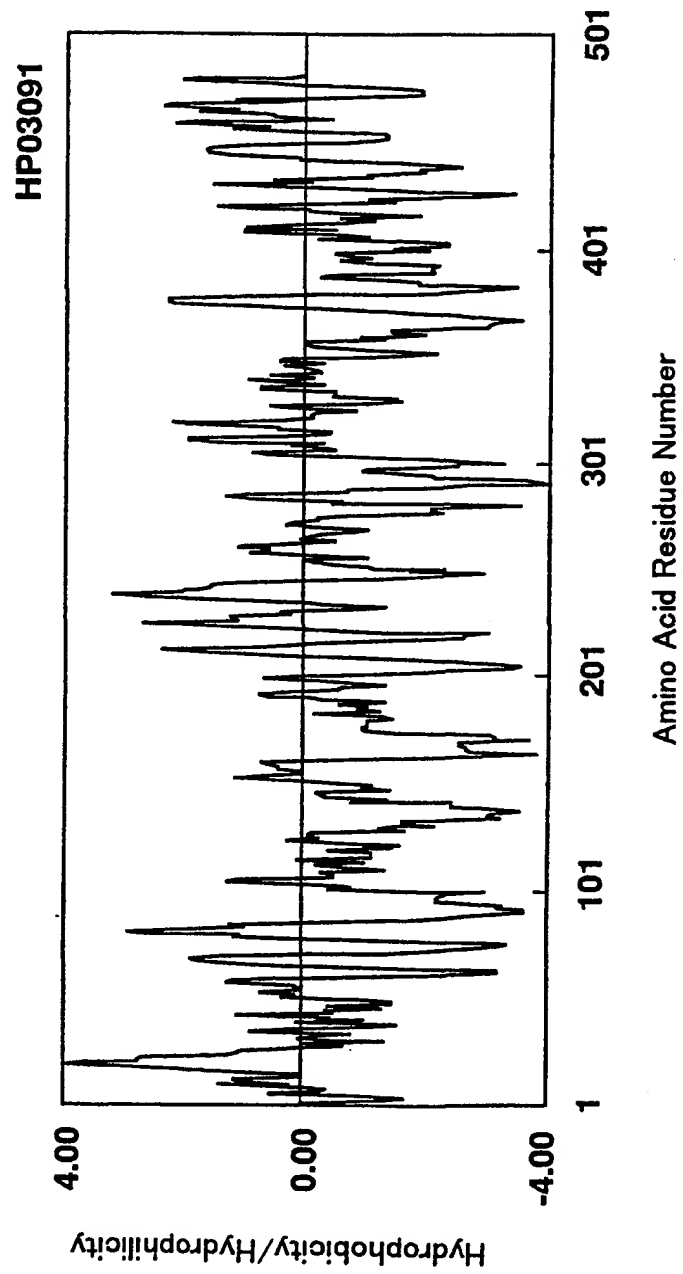
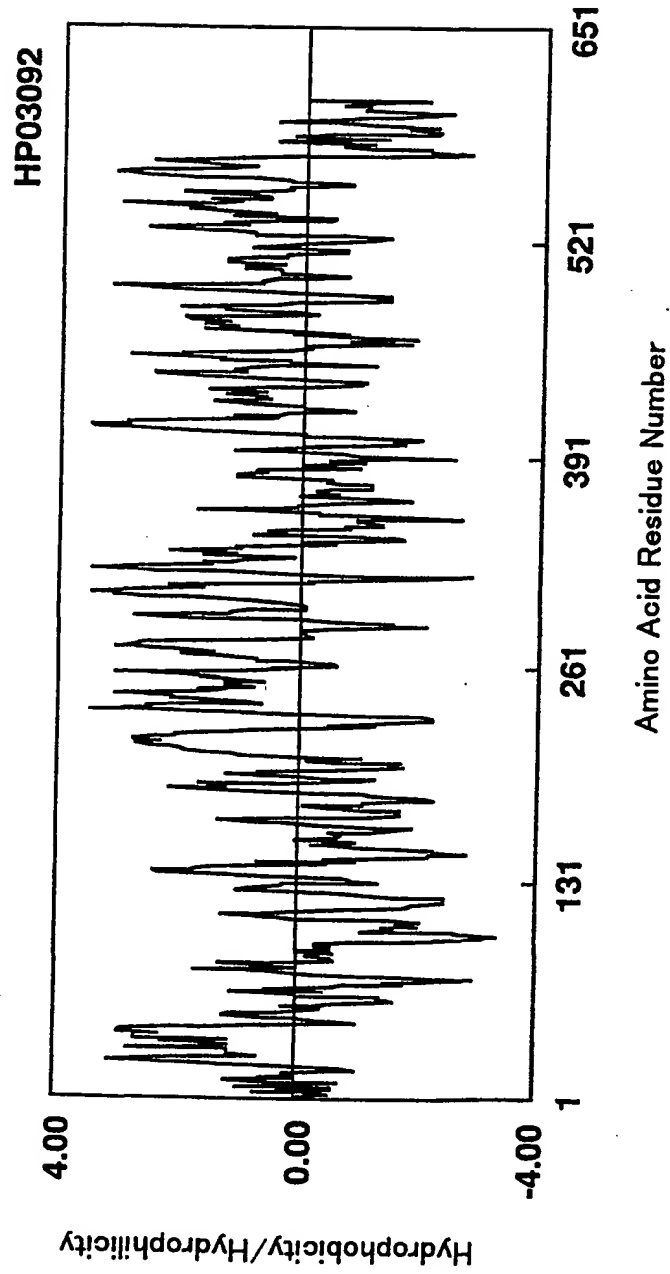
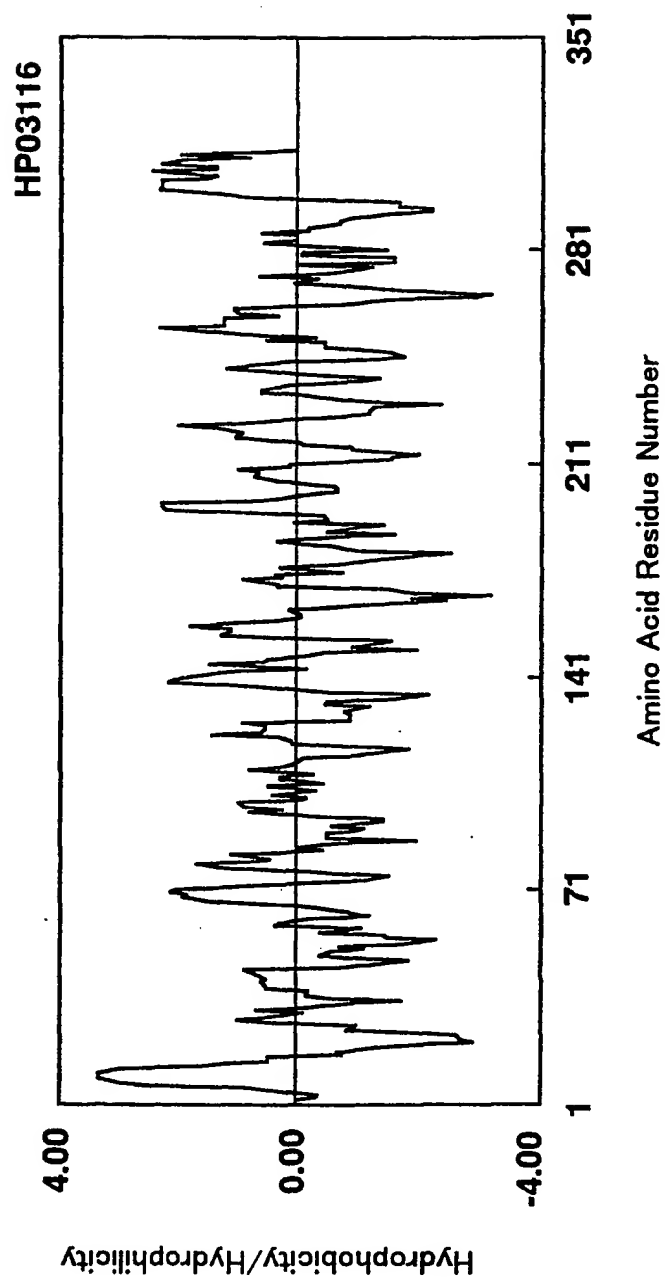


Fig.15



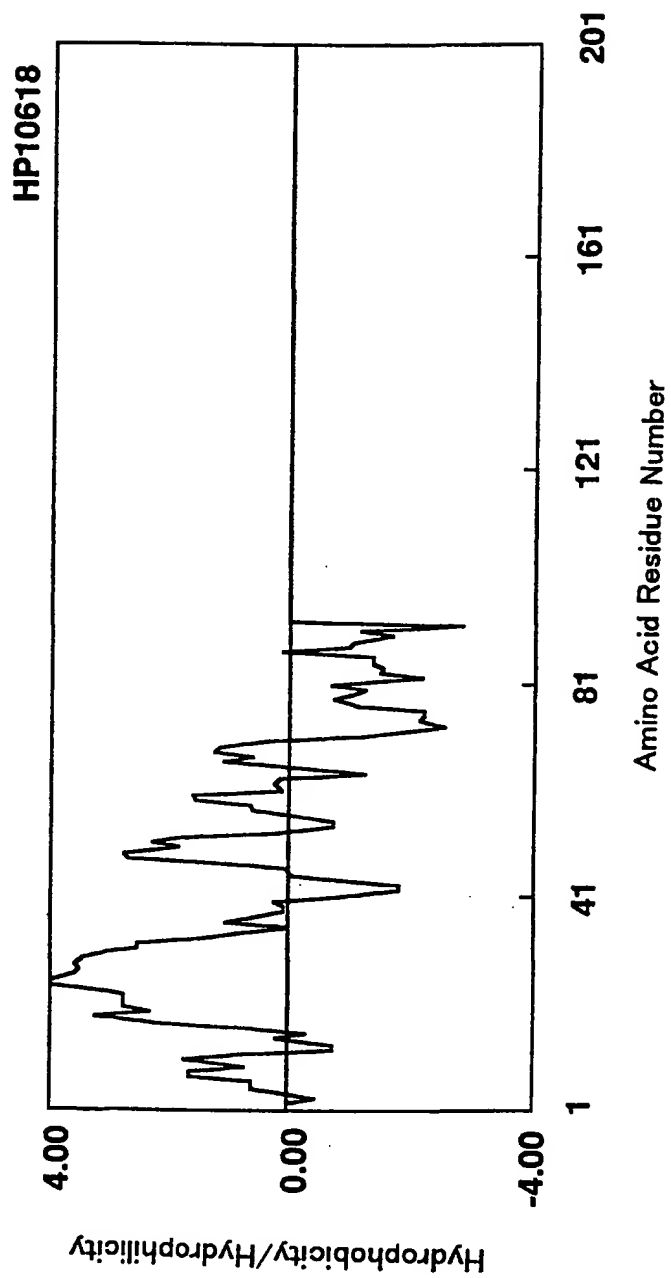
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Fig.16

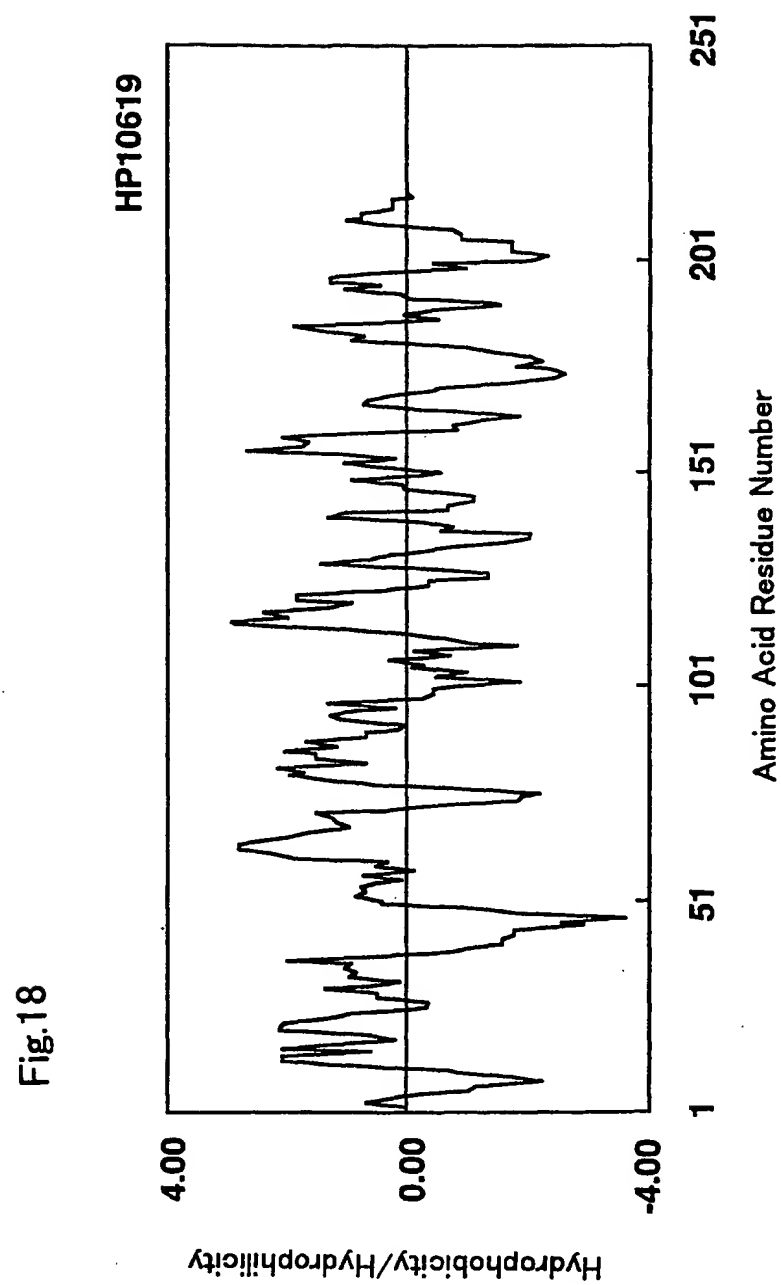


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Fig.17

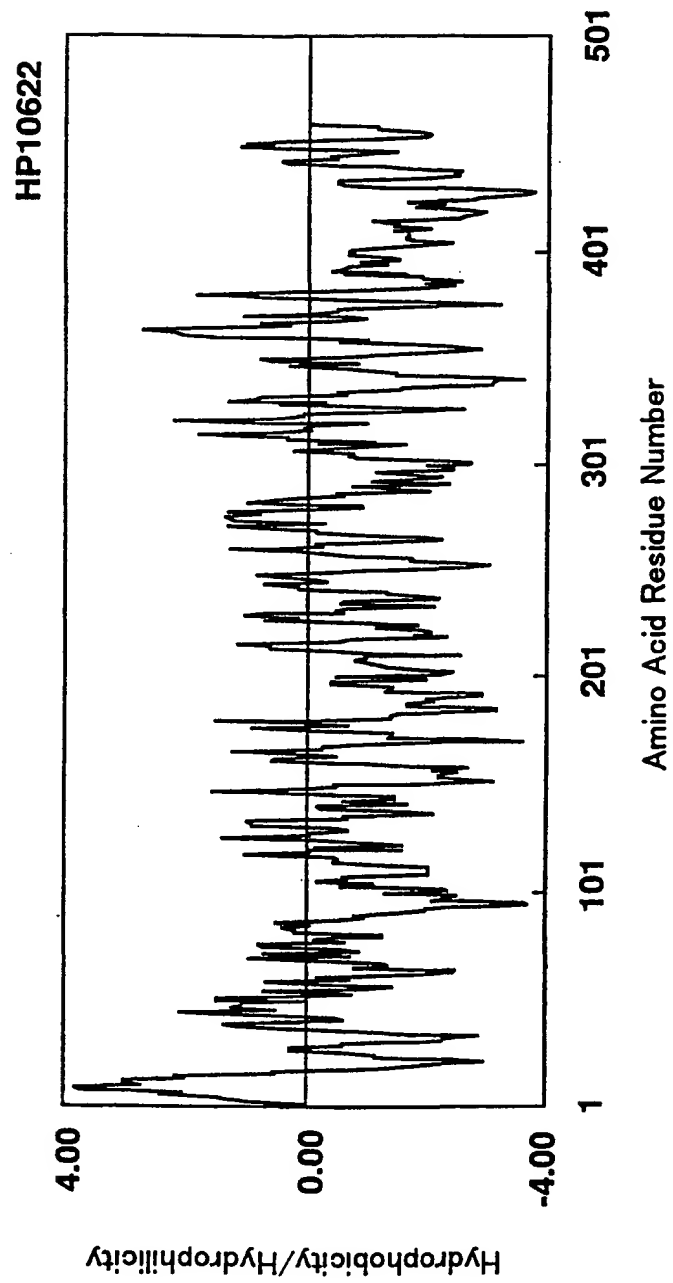


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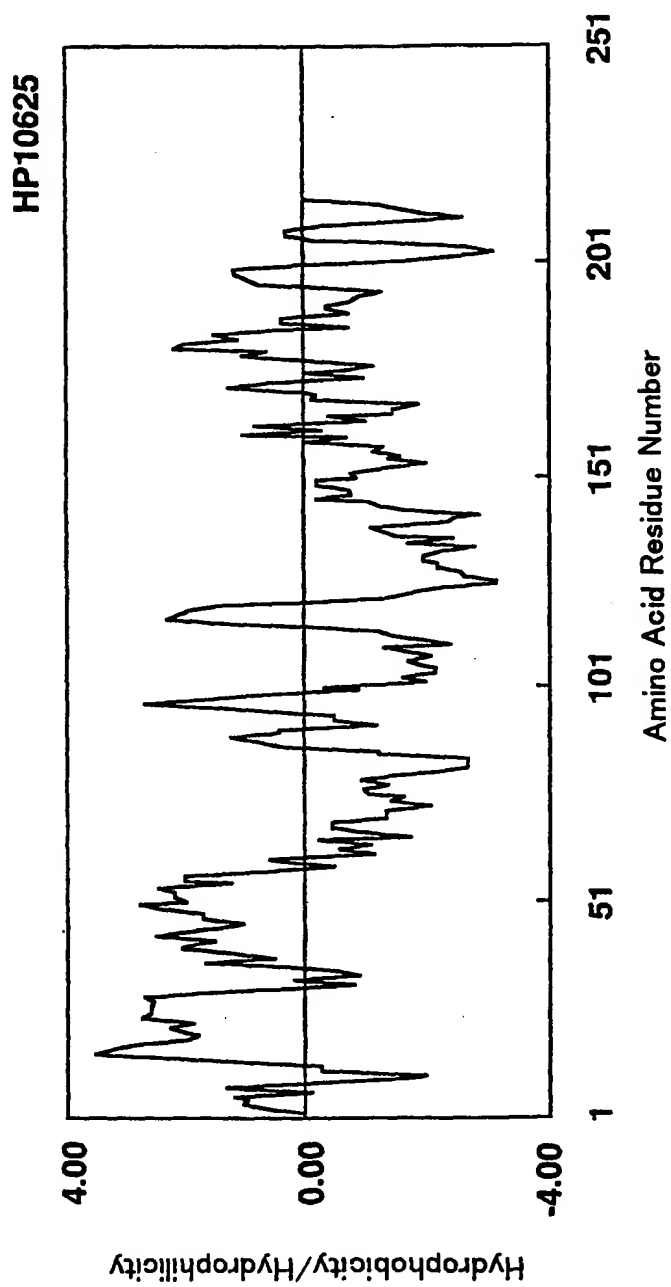
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Fig.19



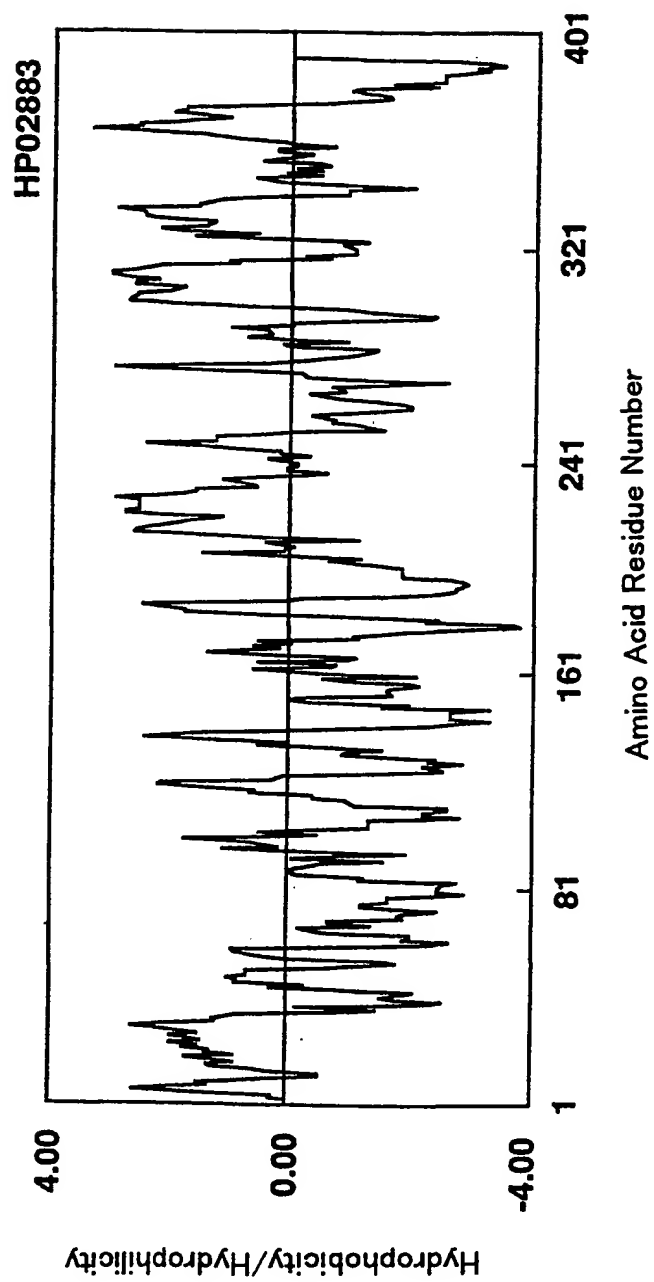
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Fig.20



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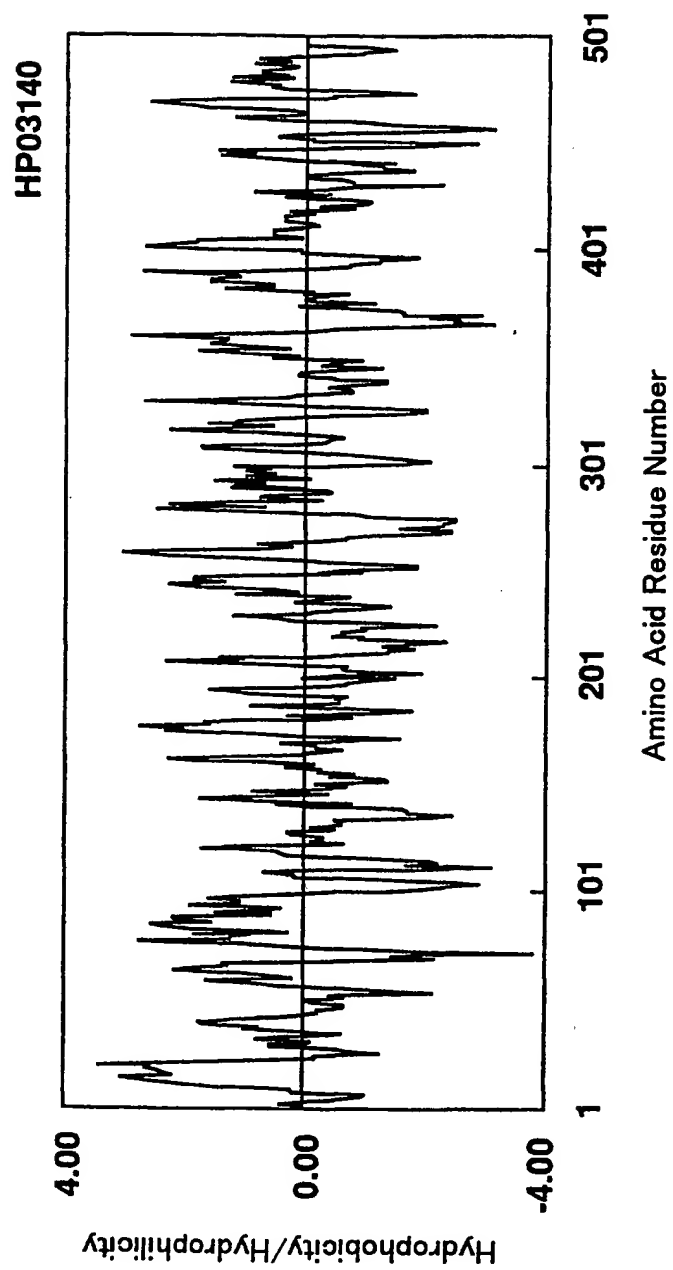
Fig.21





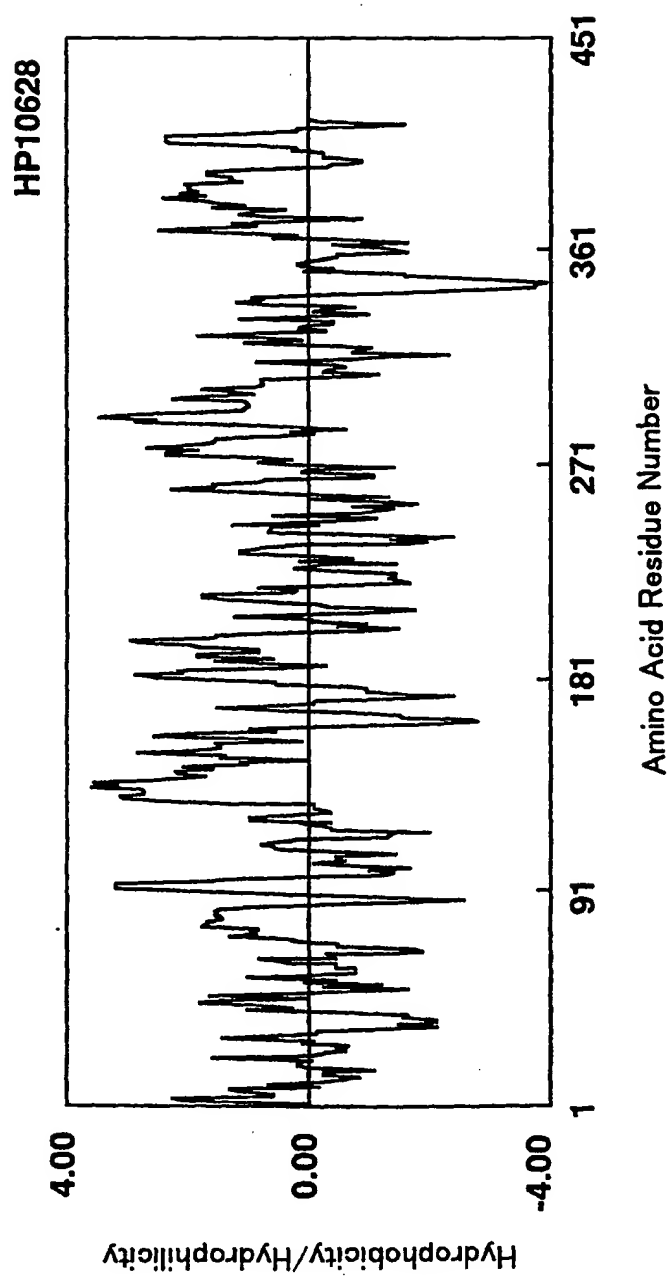
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Fig.22



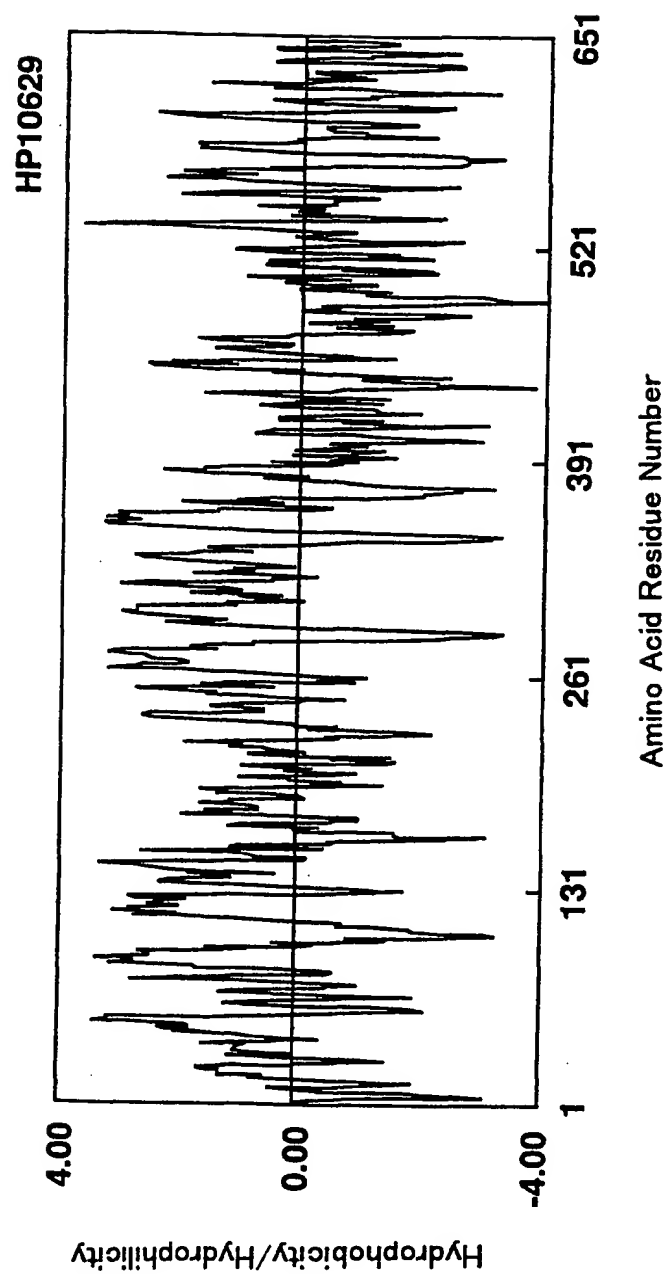
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Fig.23



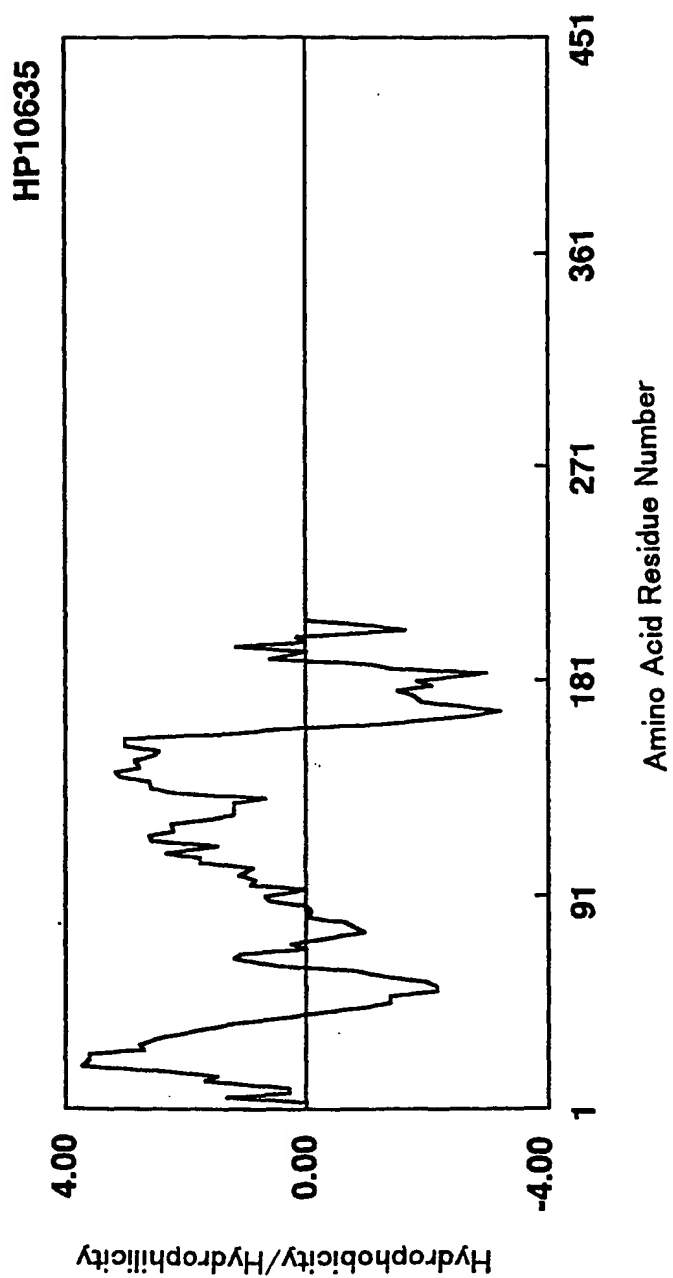
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Fig.24



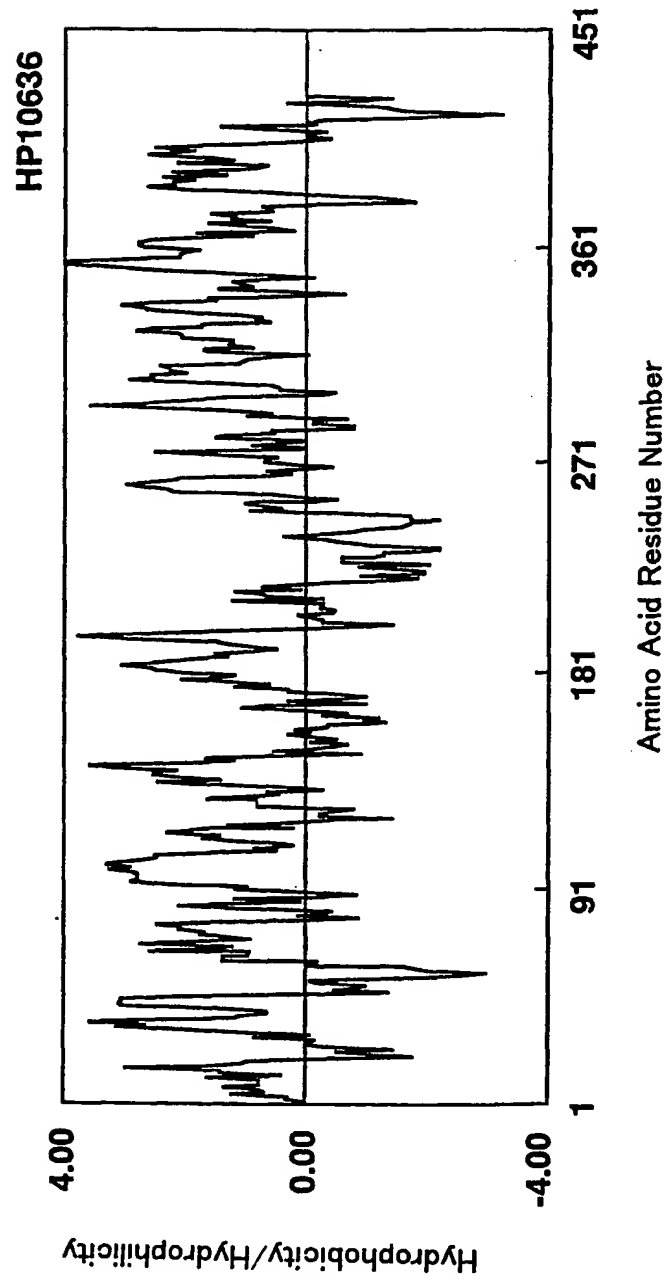
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Fig.25



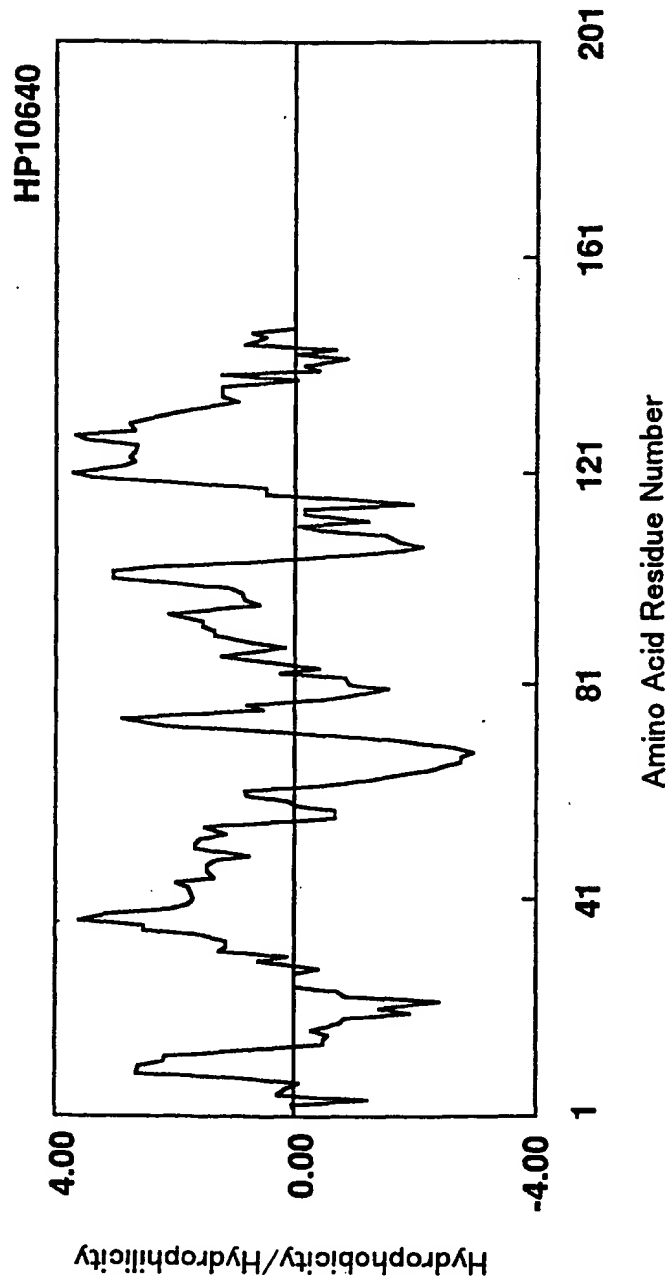
26/50

Fig.26



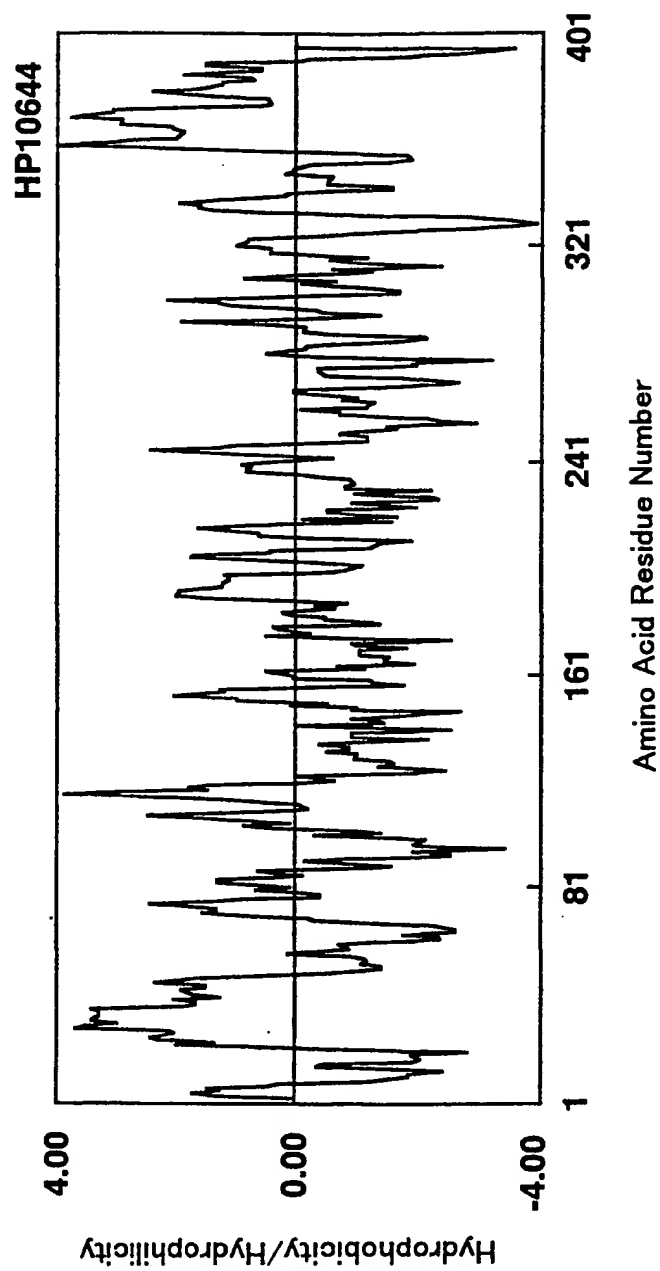
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Fig.27



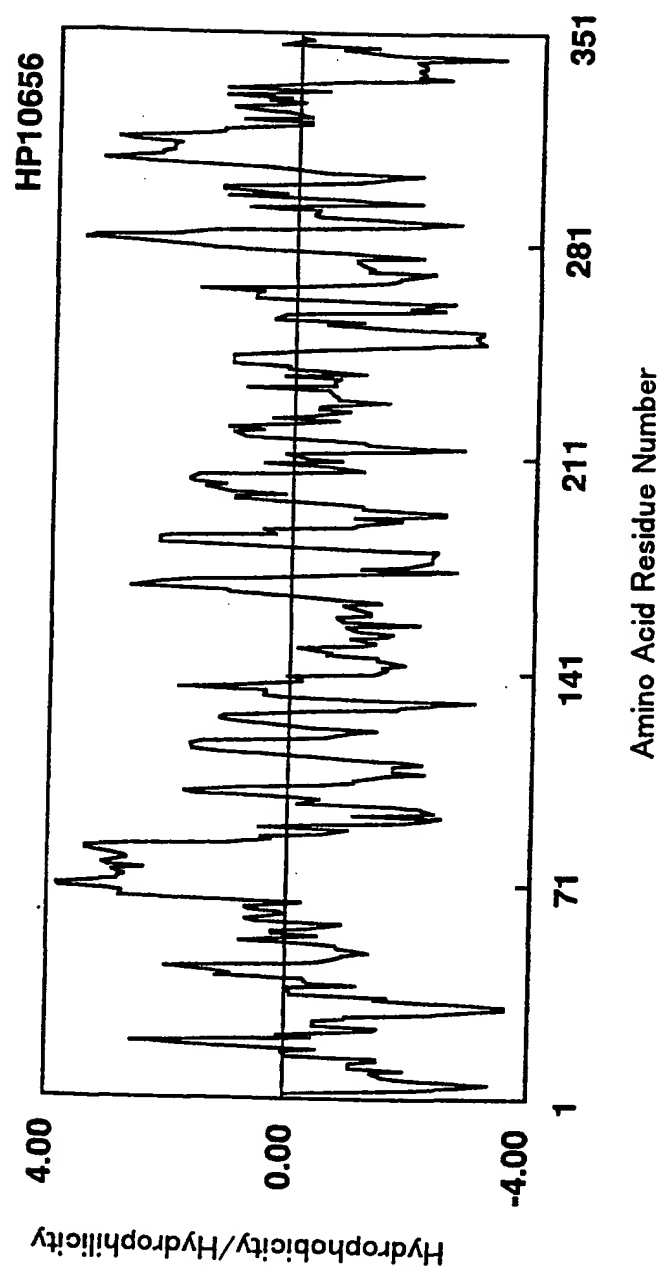
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Fig.28



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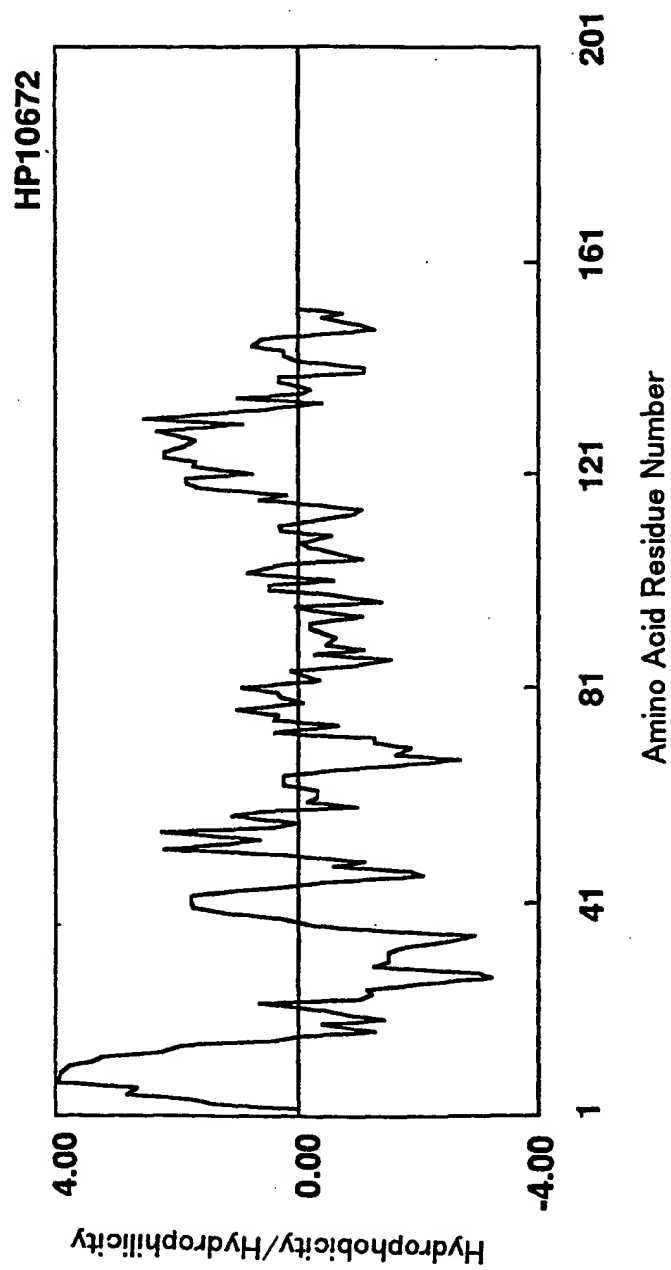
Fig.29



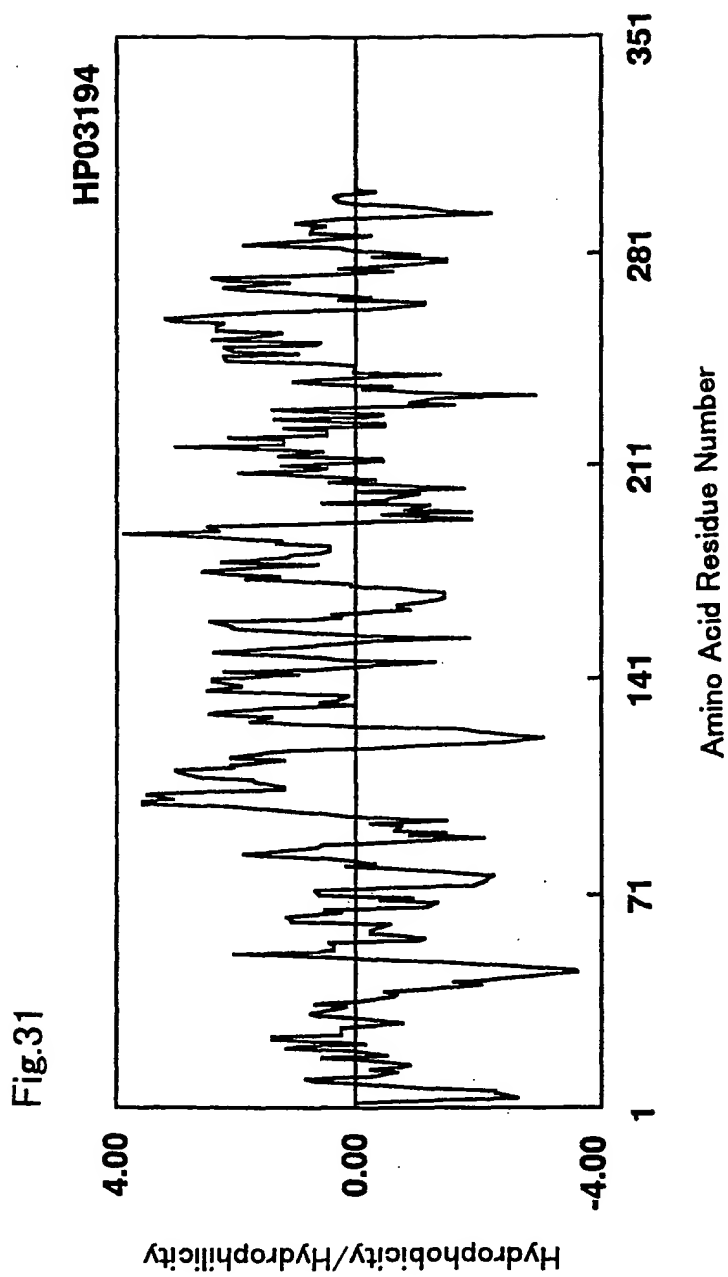


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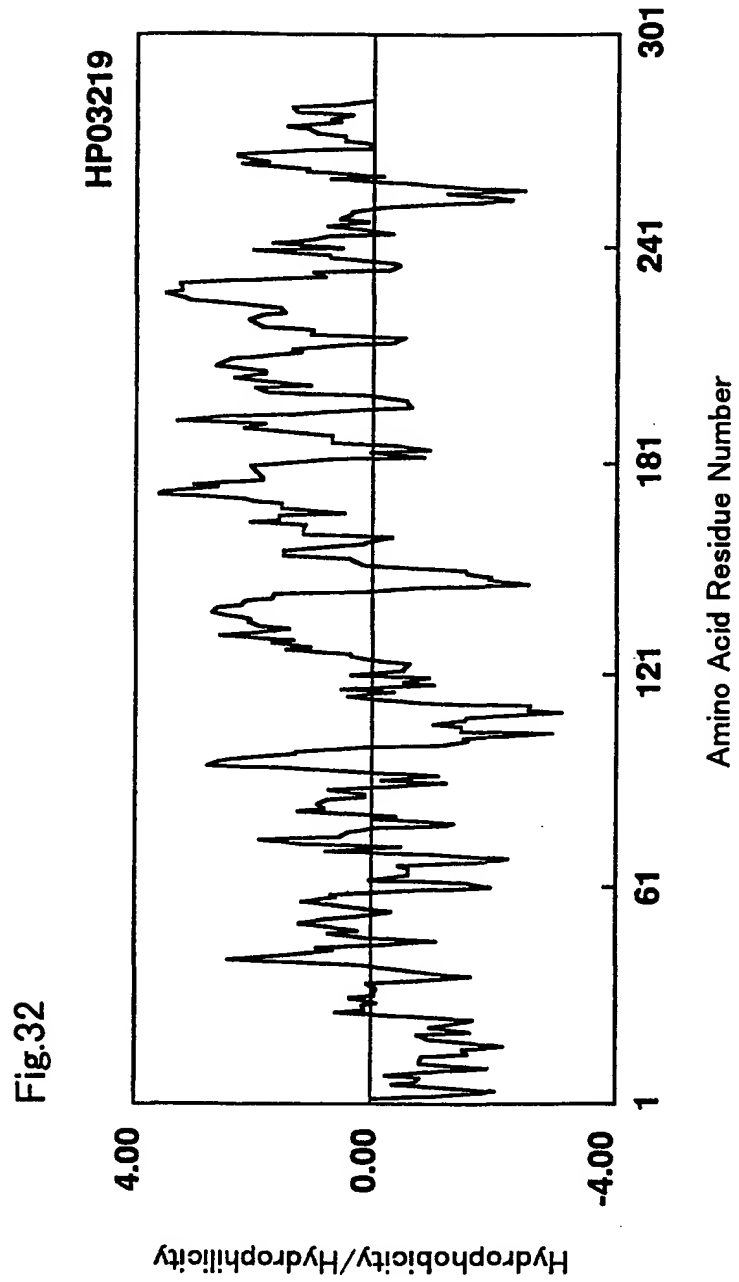
Fig.30



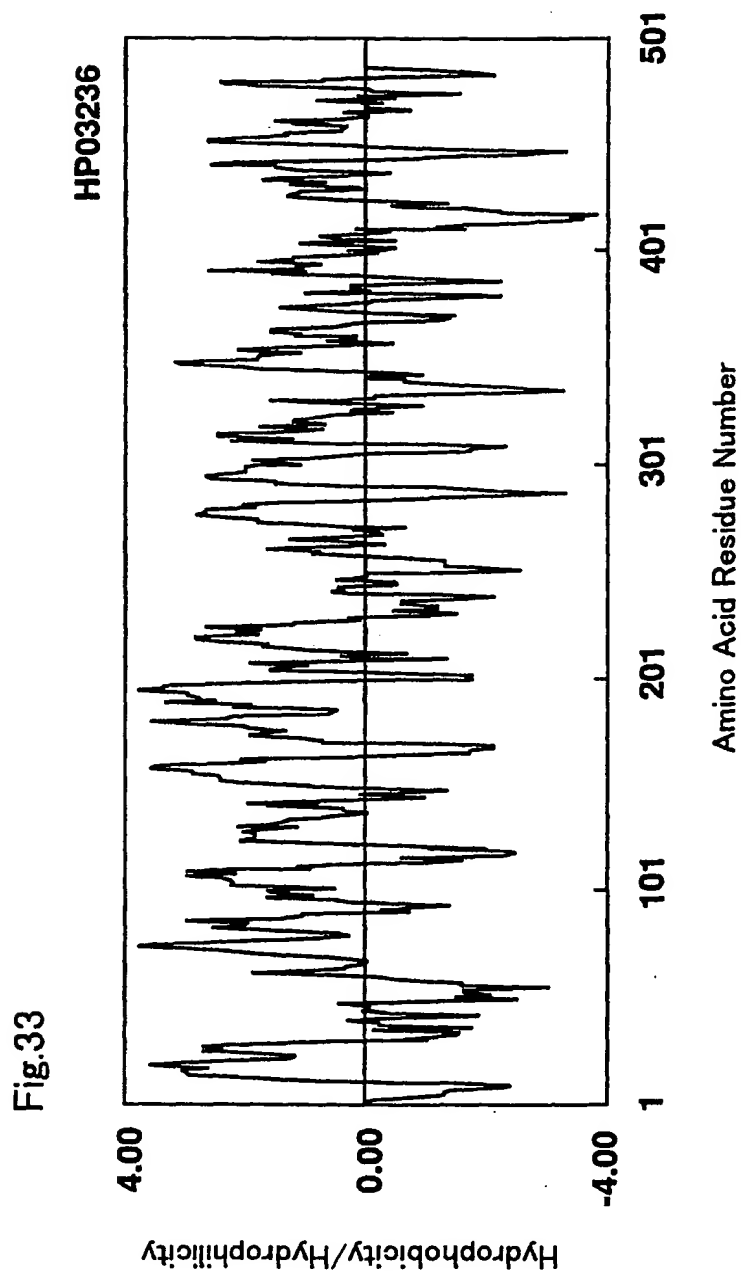
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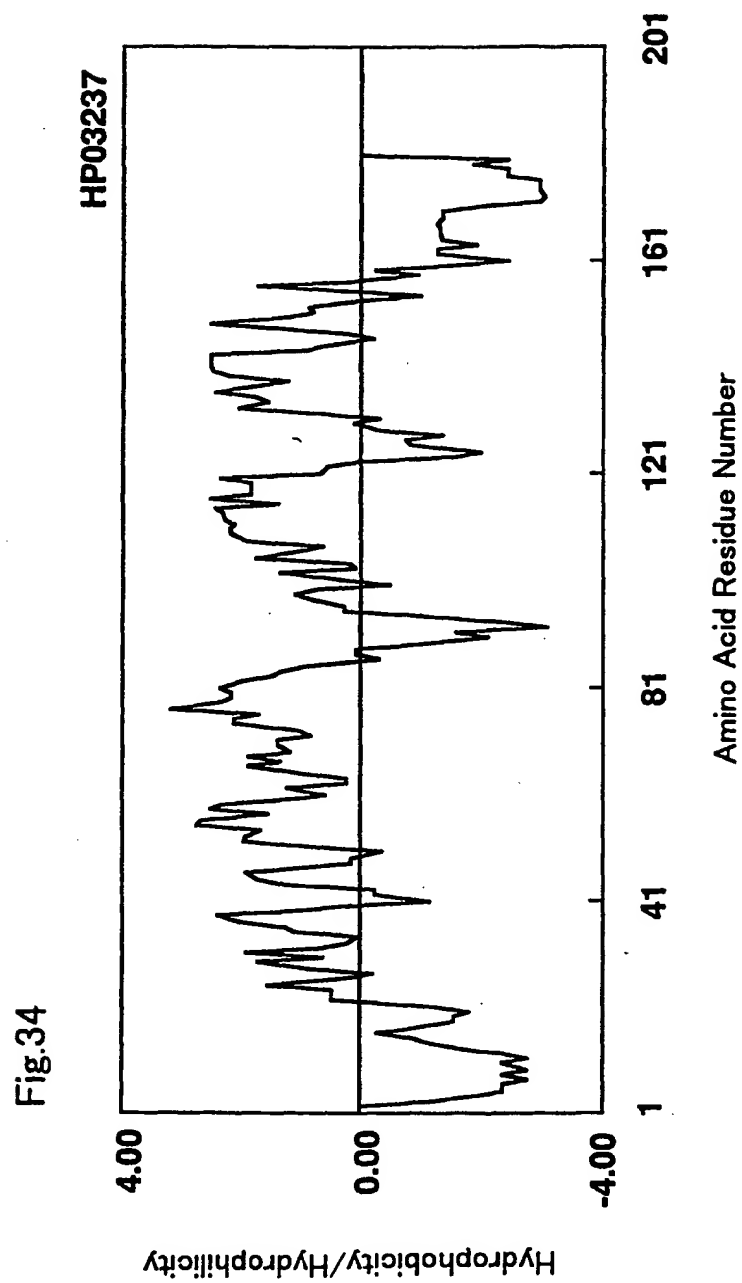
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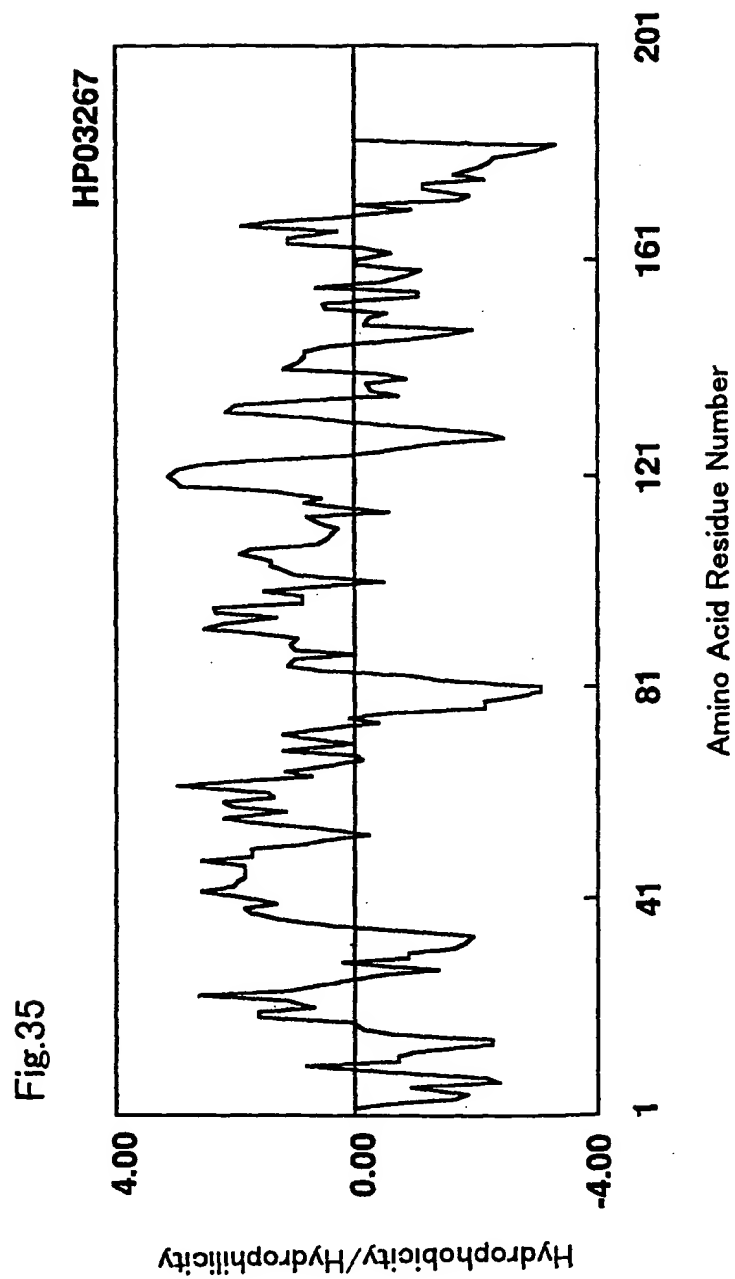
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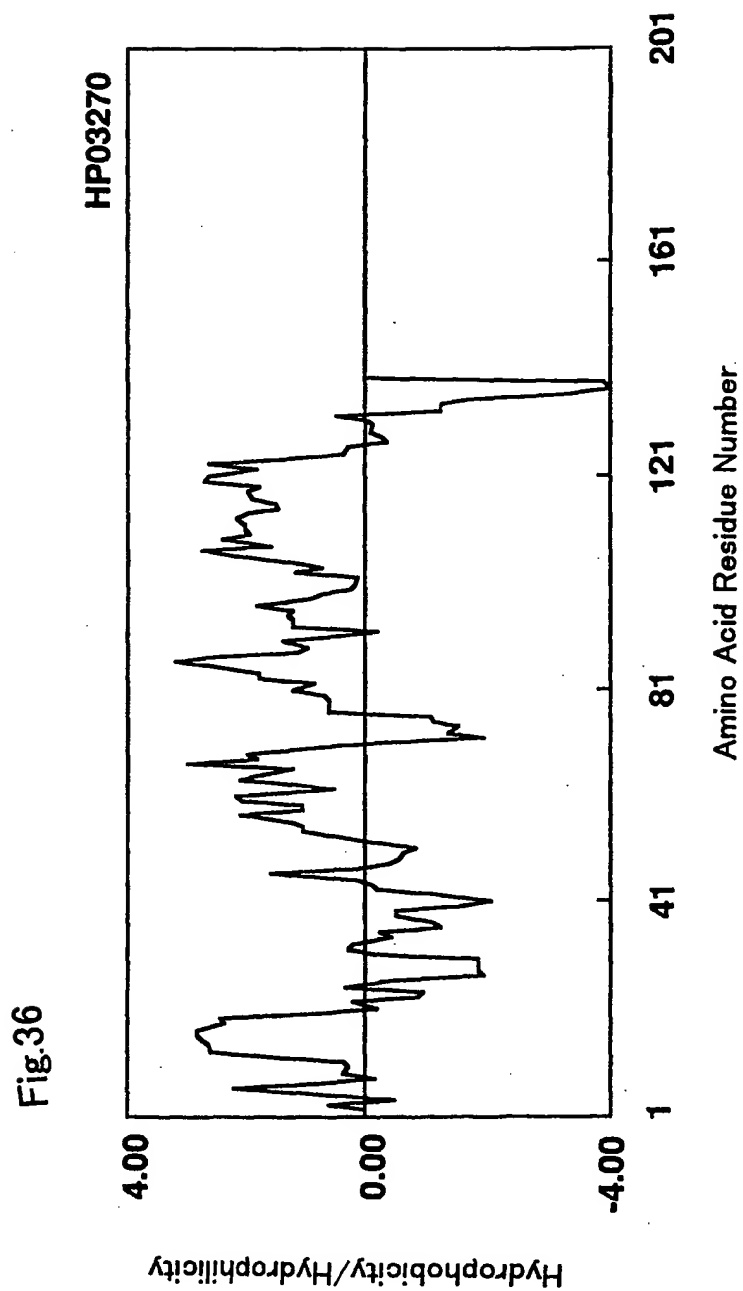
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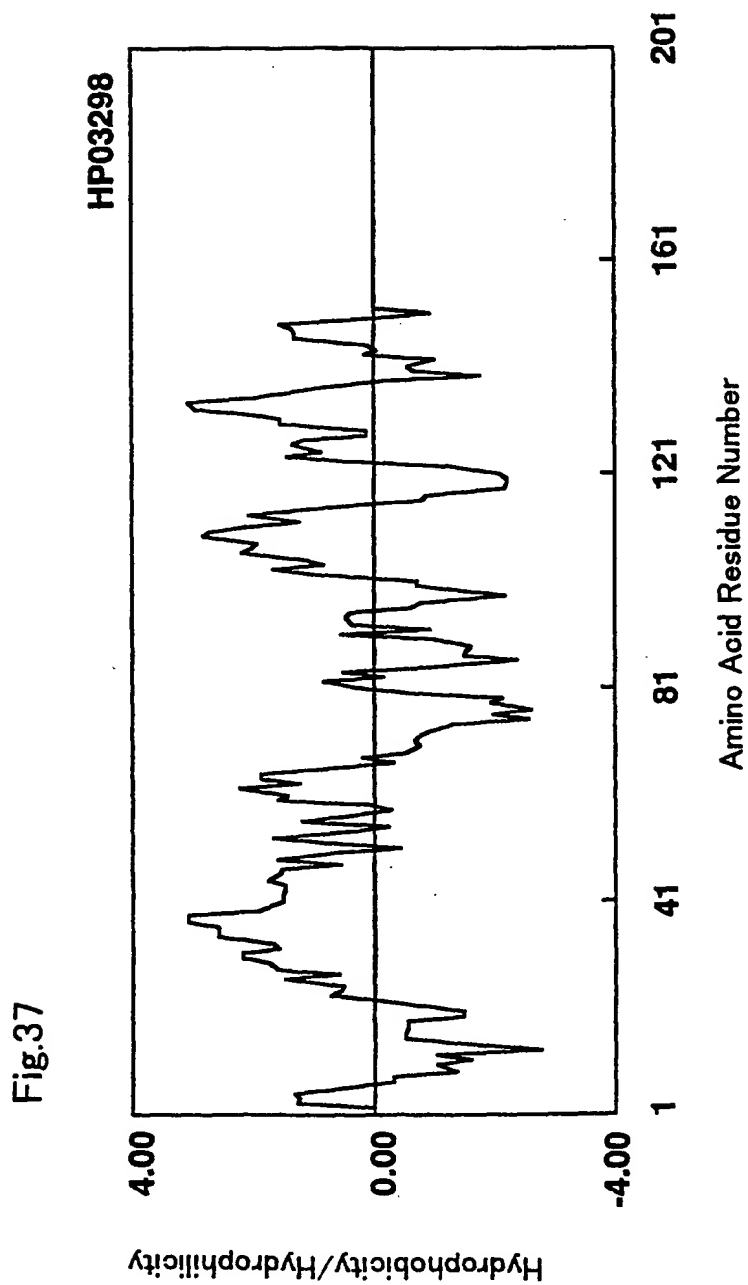
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36/50

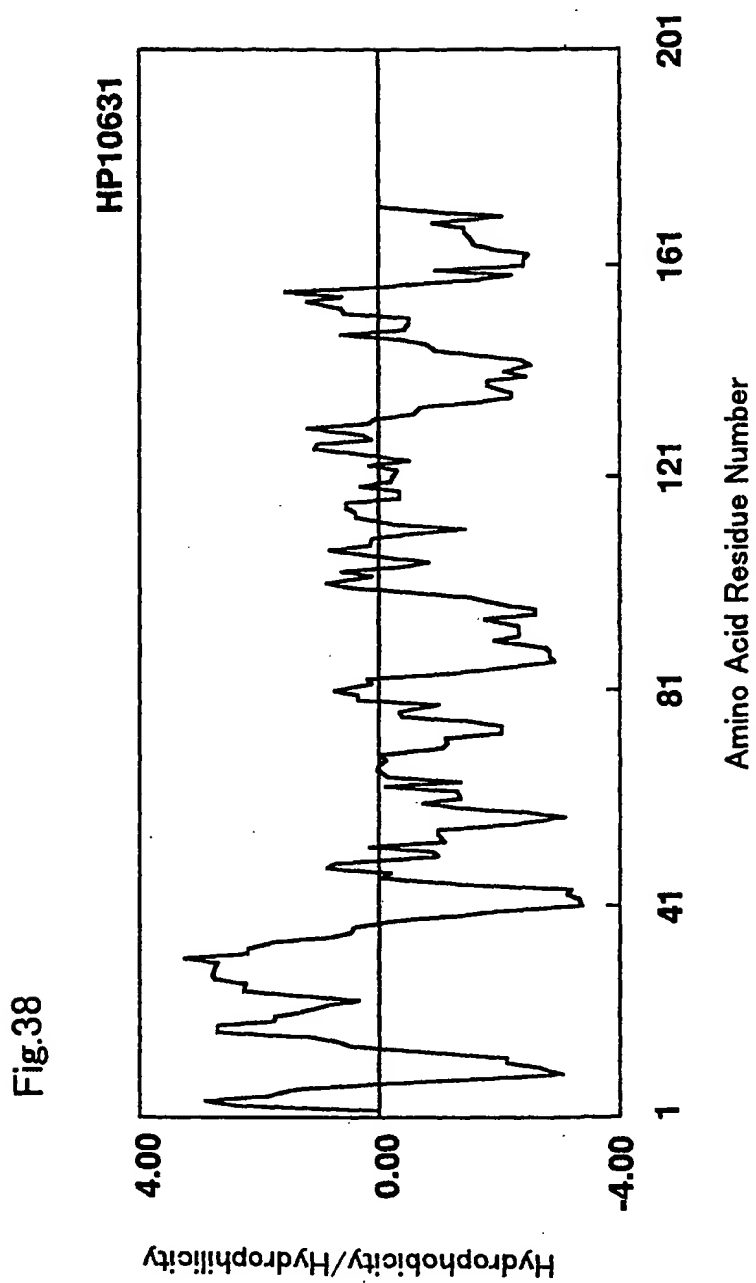


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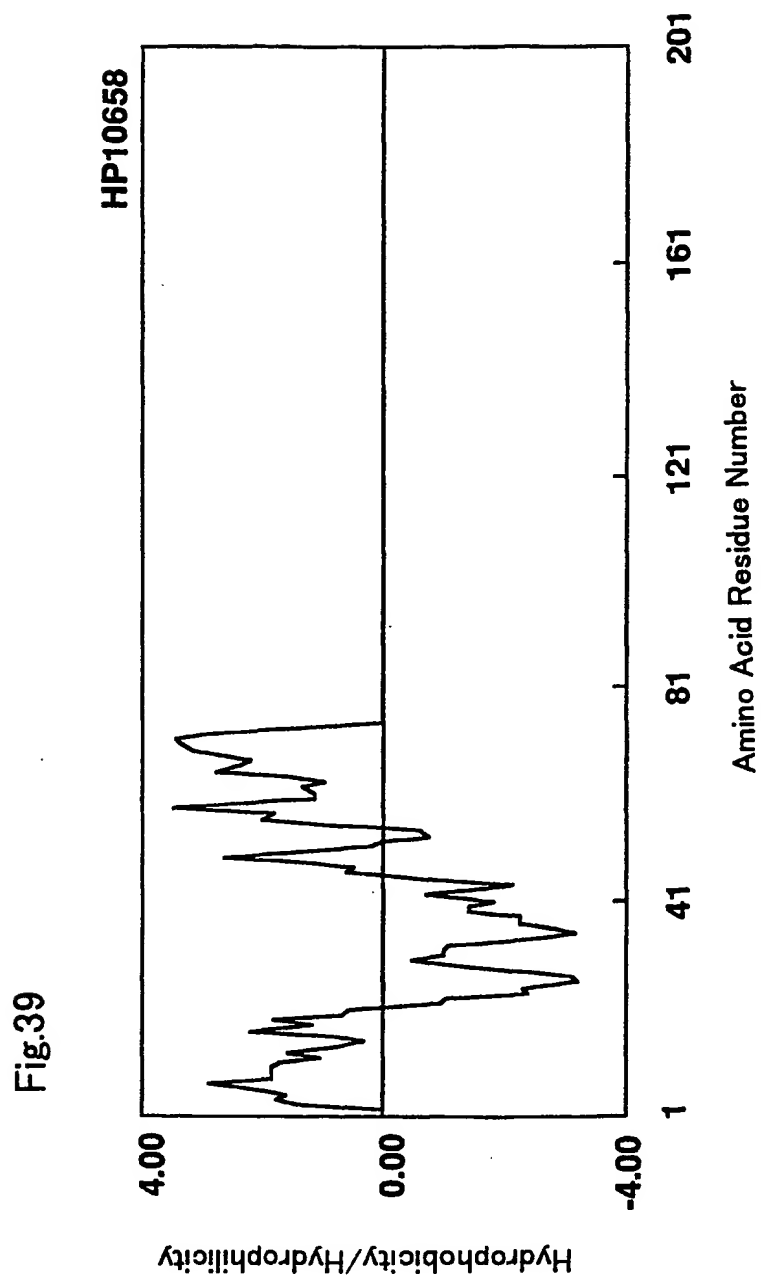




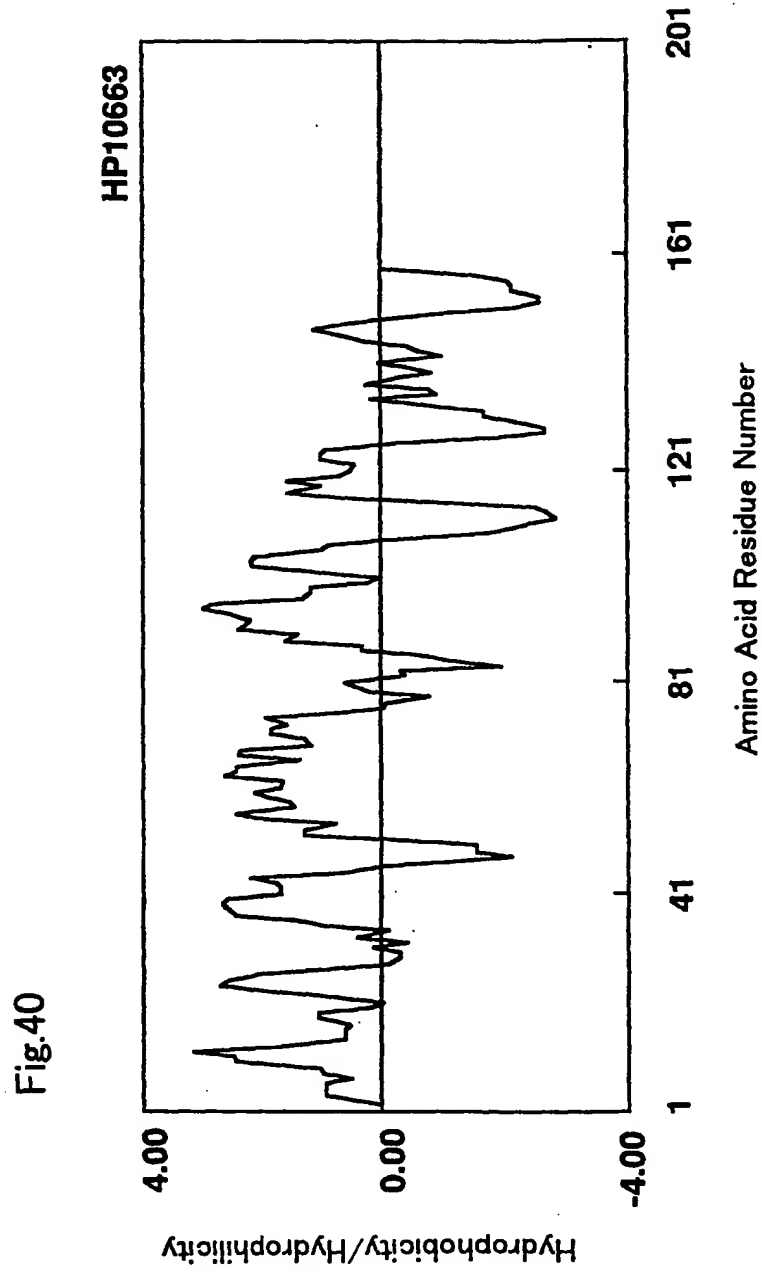
38/50



39/50

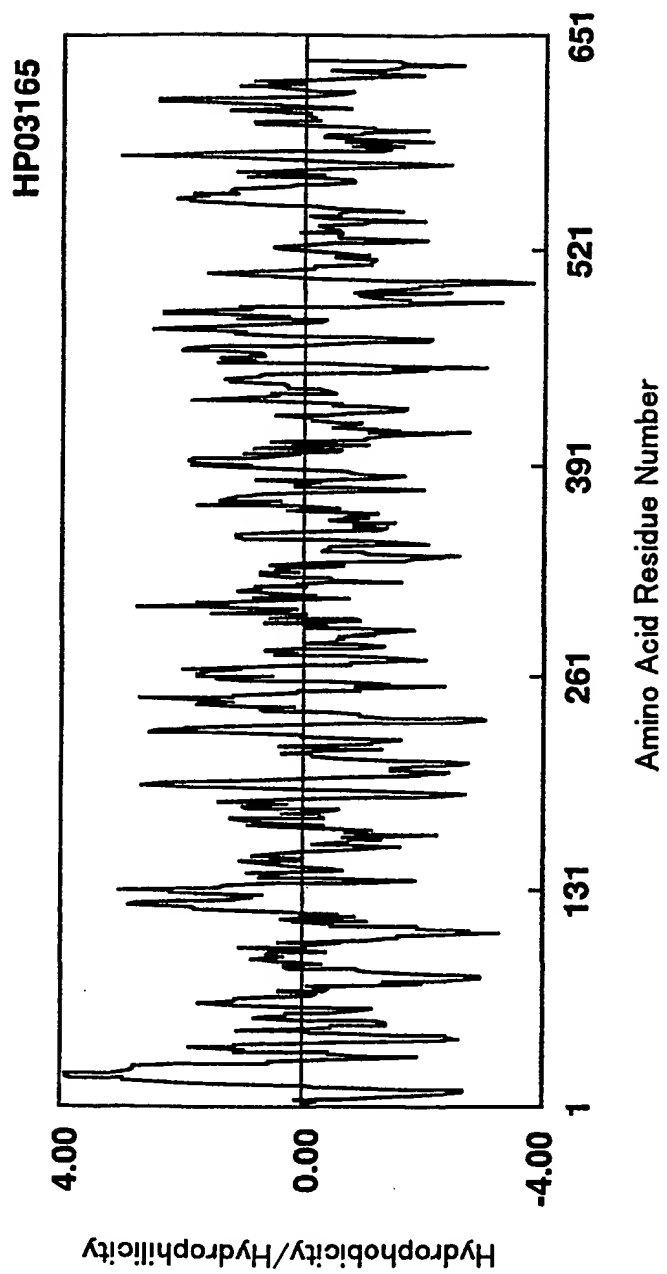


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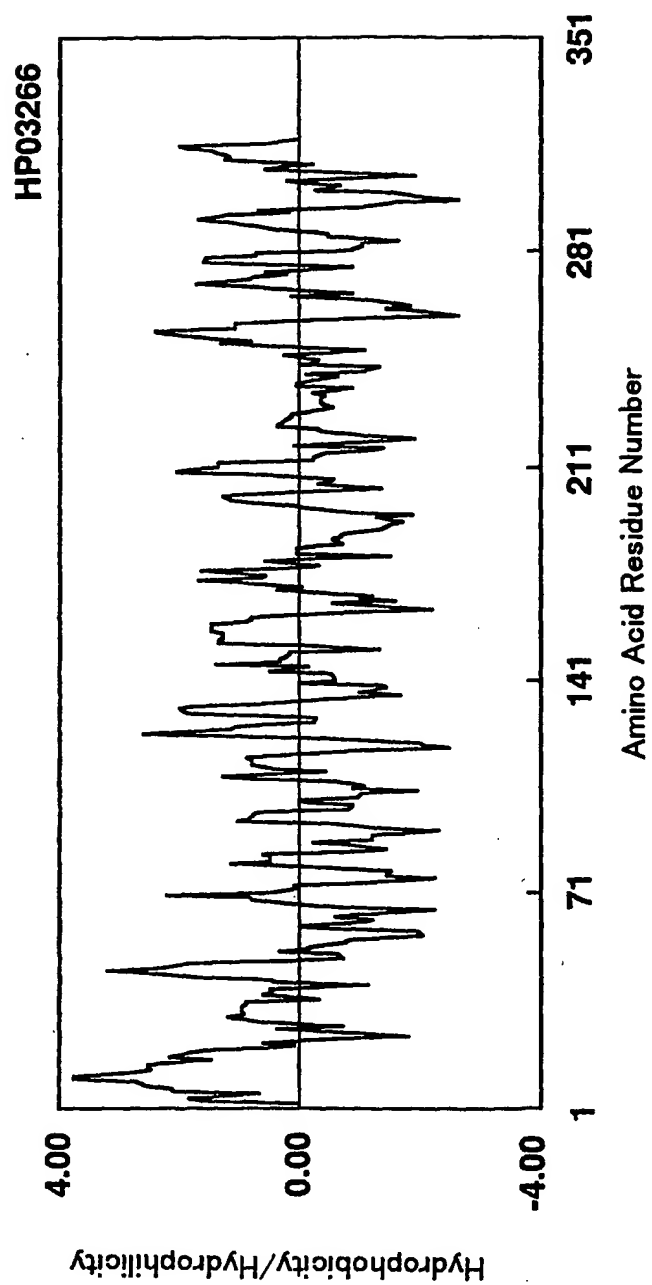
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Fig.41

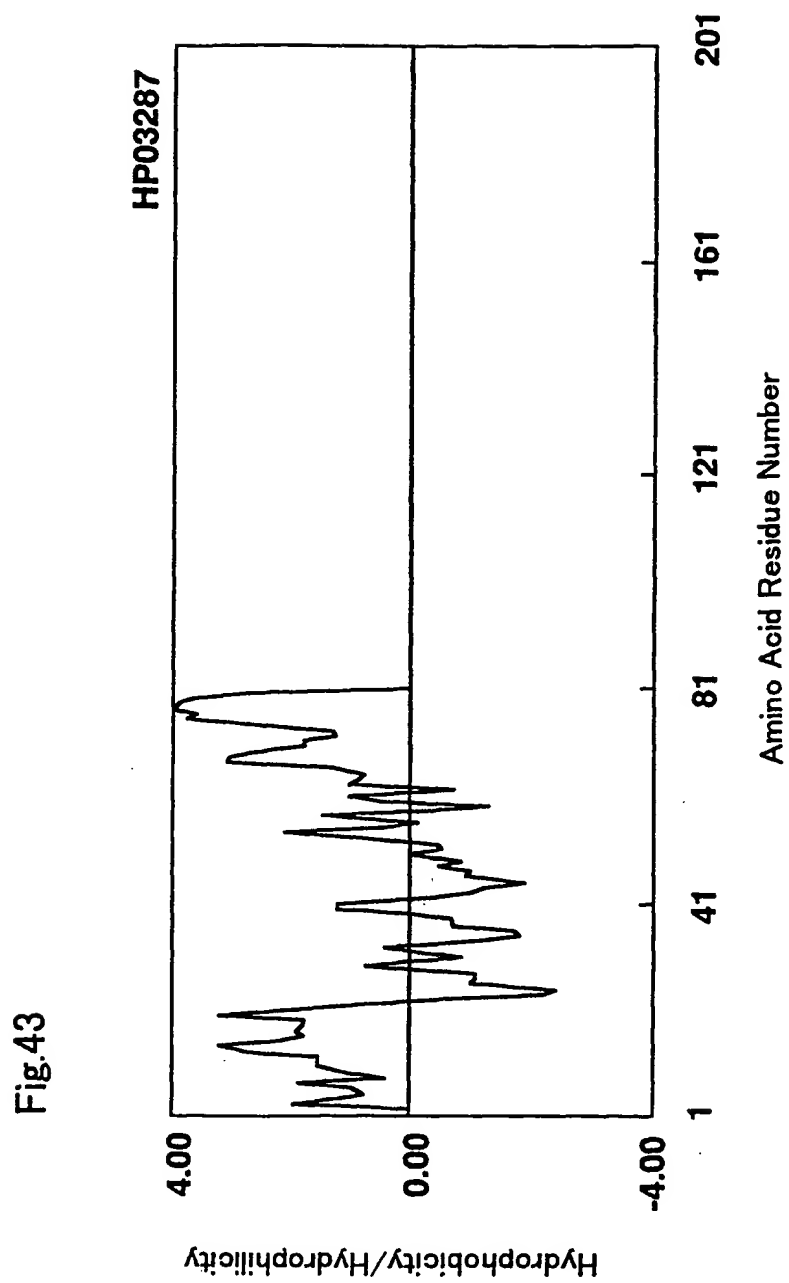


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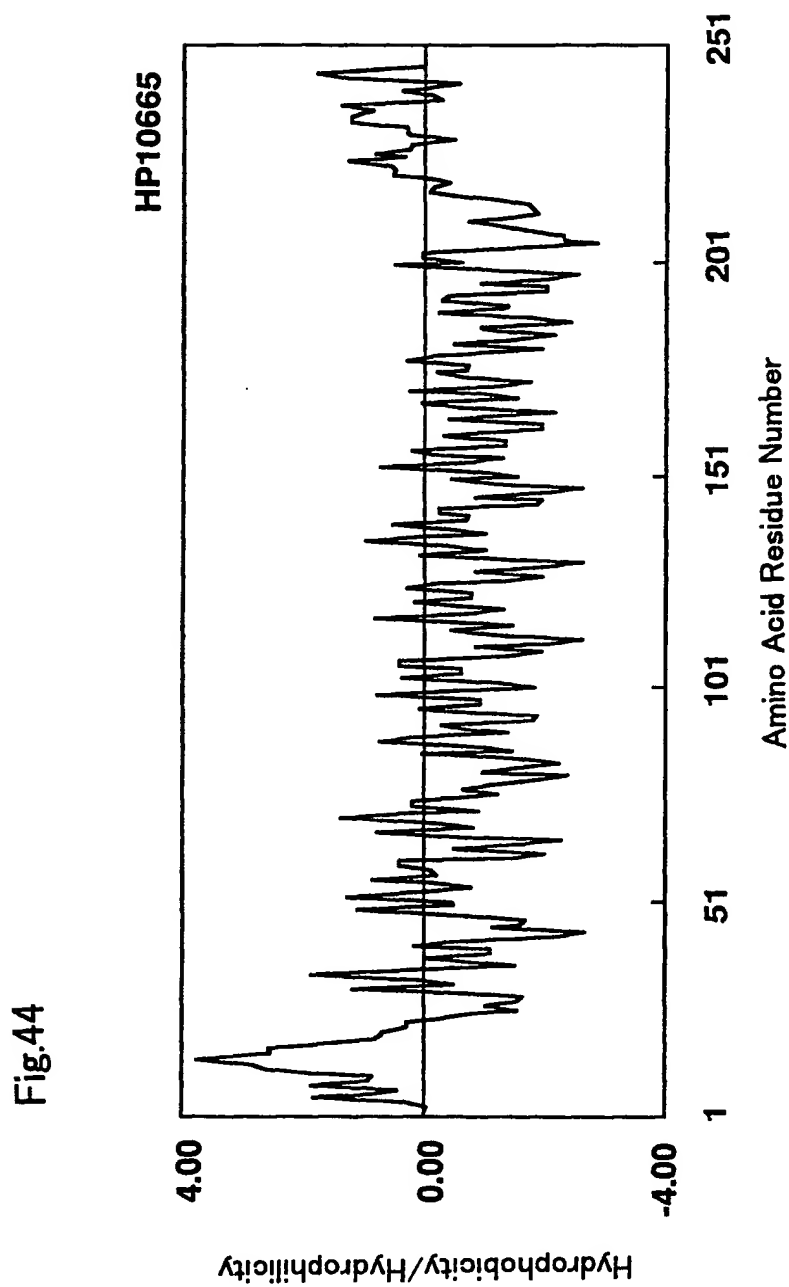
Fig.42



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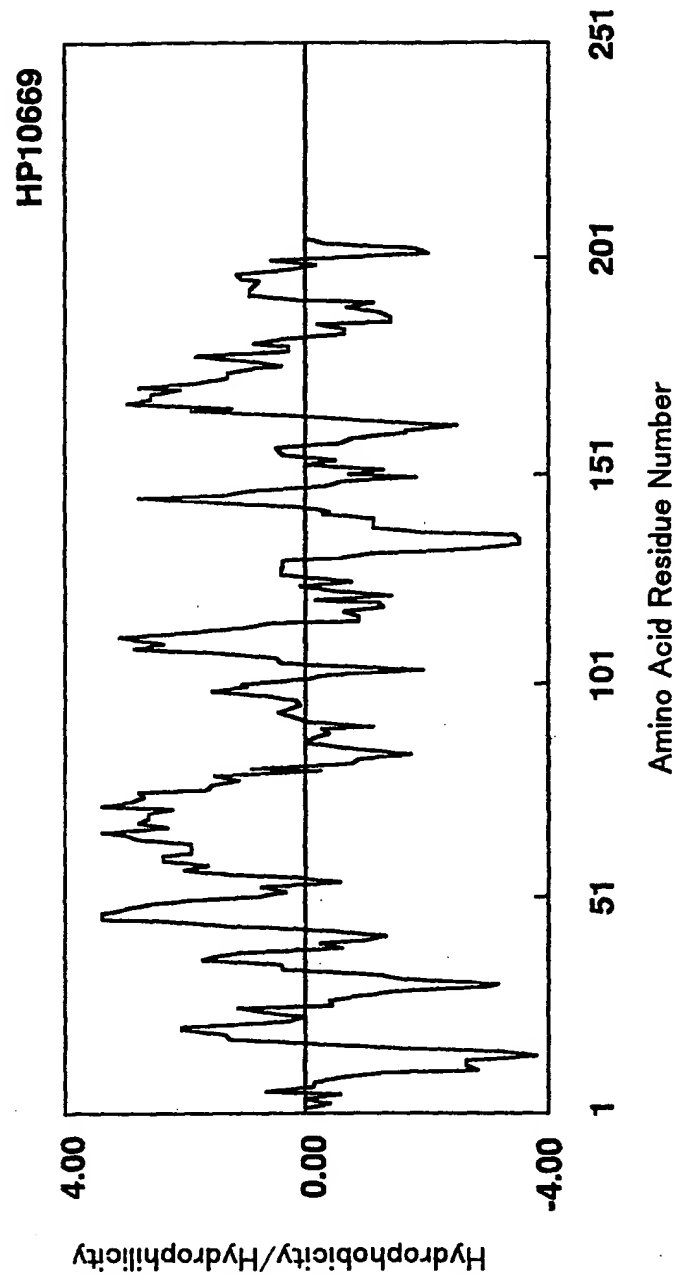


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45/50

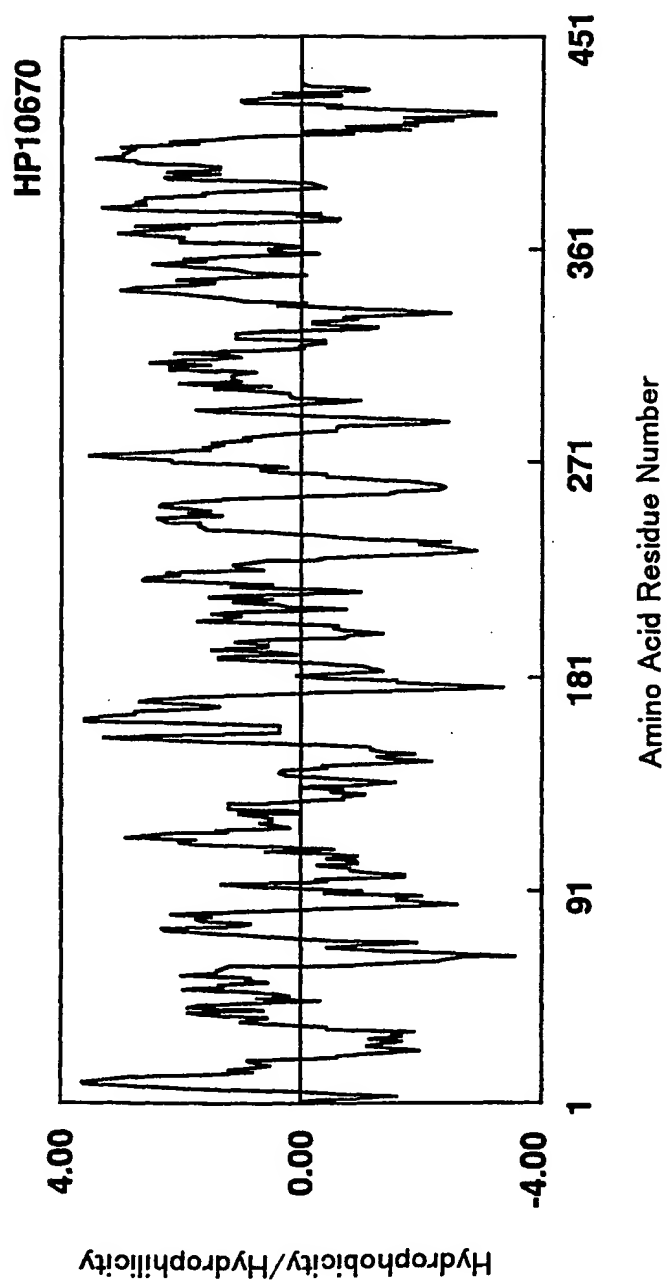
Fig.45



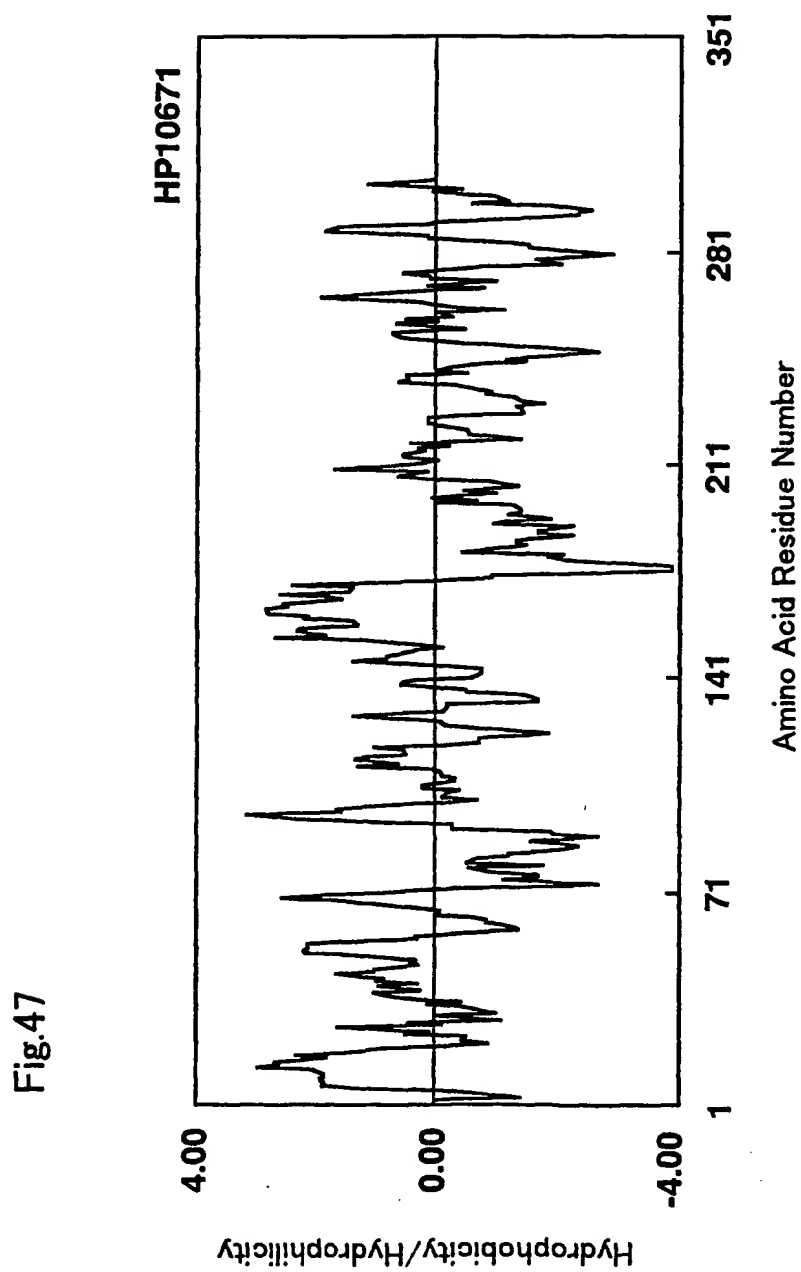


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Fig.46

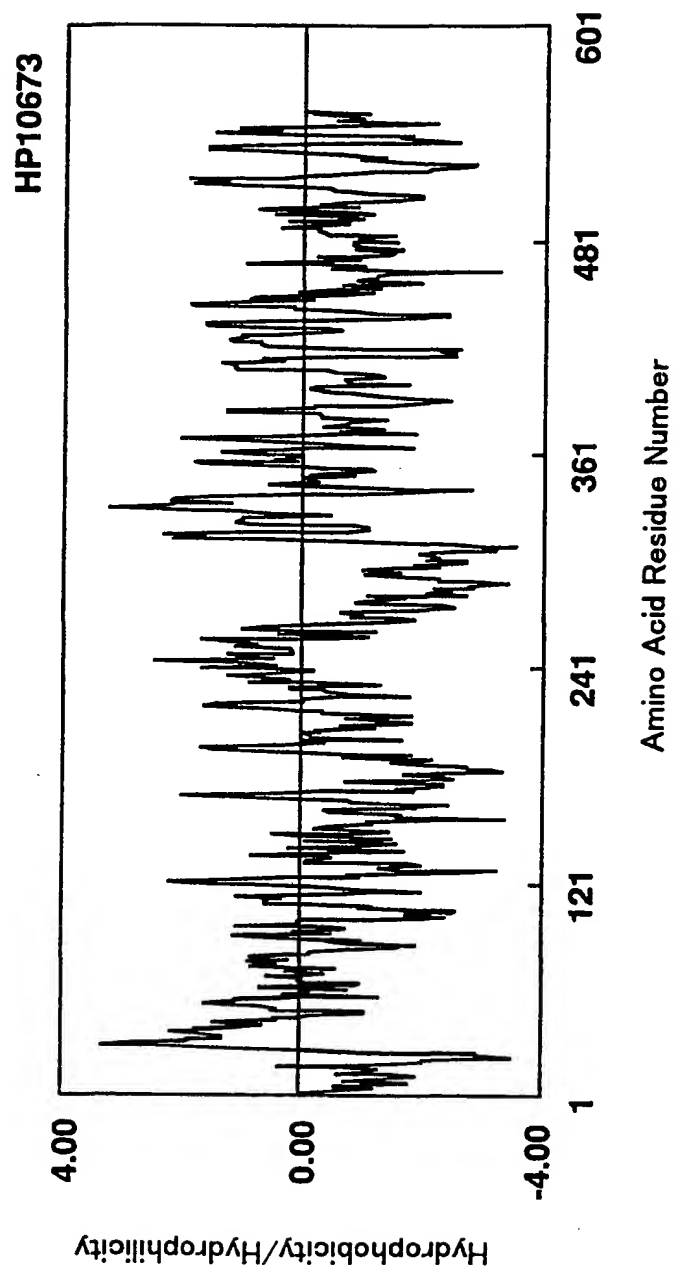


47/50



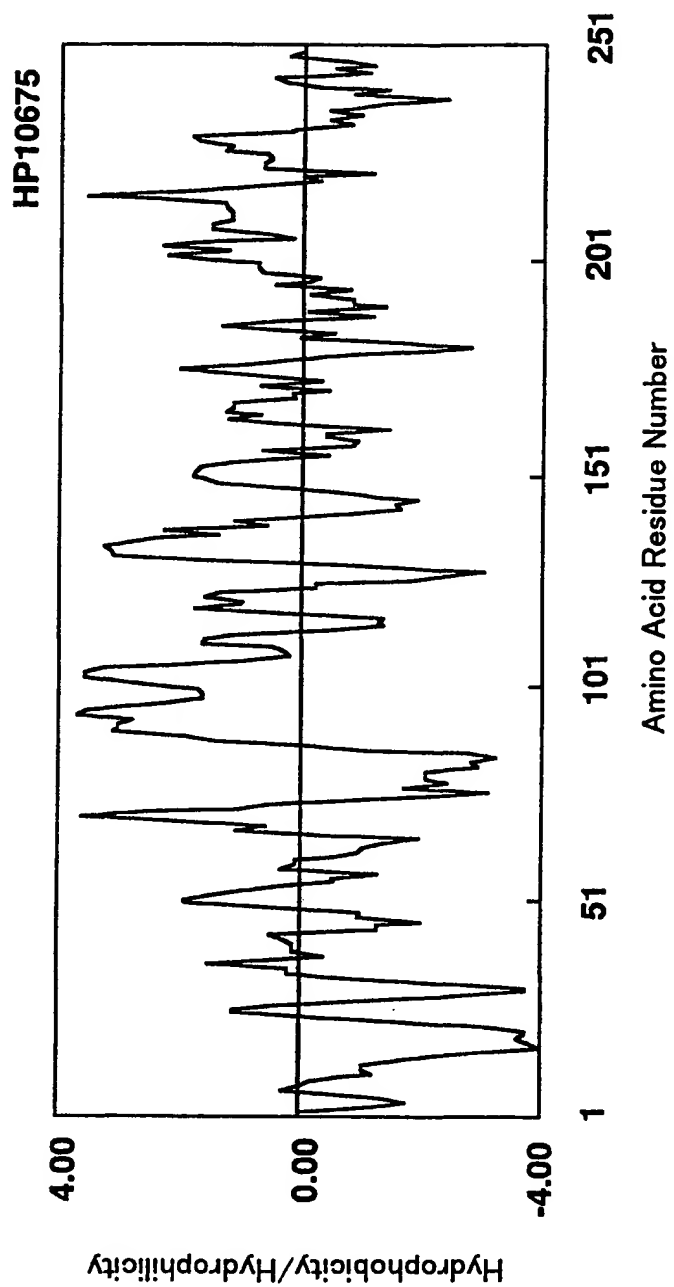
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Fig.48

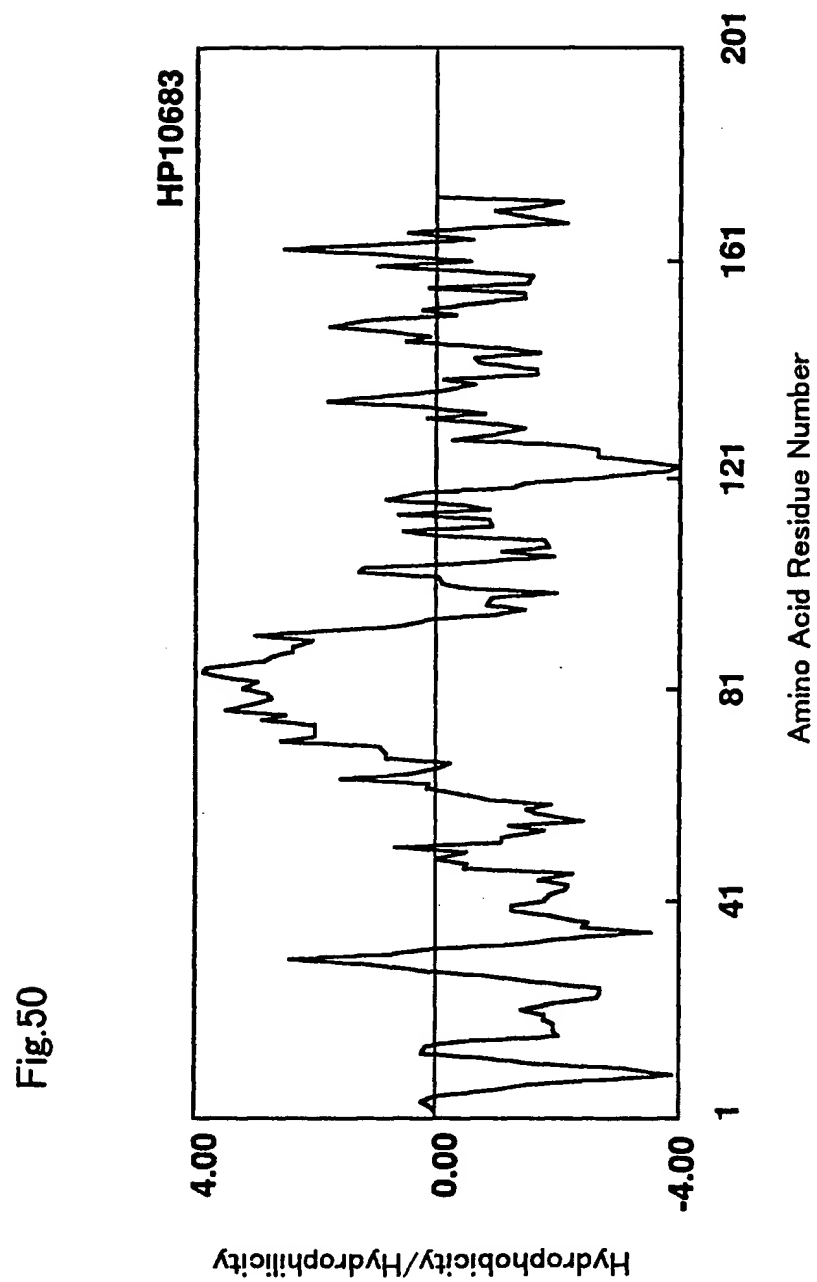


49/50

Fig.49



50/50



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Protegene Inc.

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5

10

15

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Arg Arg Leu Ala Arg Gln Leu Leu Leu Leu Leu Trp Leu Leu Glu Ala		
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Pro Leu Leu Leu Gly Val Arg Ala Gln Ala Ala Gly Gln Gly Pro Gly		
65	70	75
Gln Gly Pro Gly Pro Gly Gln Gln Pro Pro Pro Pro Pro Gln Gln Gln		
85	90	95
Gln Ser Gly Gln Gln Tyr Asn Gly Glu Arg Gly Ile Ser Val Pro Asp		
100	105	110
His Gly Tyr Cys Gln Pro Ile Ser Ile Pro Leu Cys Thr Asp Ile Ala		
115	120	125
Tyr Asn Gln Thr Ile Met Pro Asn Leu Leu Gly His Thr Asn Gln Glu		
130	135	140
Asp Ala Gly Leu Glu Val His Gln Phe Tyr Pro Leu Val Lys Val Gln		
145	150	155
Cys Ser Ala Glu Leu Lys Phe Phe Leu Cys Ser Met Tyr Ala Pro Val		
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Cys Thr Val Leu Glu Gln Ala Leu Pro Pro Cys Arg Ser Leu Cys Glu		
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Arg Ala Arg Gln Gly Cys Glu Ala Leu Met Asn Lys Phe Gly Phe Gln		
195	200	205
Trp Pro Asp Thr Leu Lys Cys Glu Lys Phe Pro Val His Gly Ala Gly		
210	215	220
Glu Leu Cys Val Gly Gln Asn Thr Ser Asp Lys Gly Thr Pro Thr Pro		
225	230	235
Ser Leu Leu Pro Glu Phe Trp Thr Ser Asn Pro Gln His Gly Gly Gly		
245	250	255
Gly His Arg Gly Gly Phe Pro Gly Gly Ala Gly Ala Ser Glu Arg Gly		
260	265	270
Lys Phe Ser Cys Pro Arg Ala Leu Lys Val Pro Ser Tyr Leu Asn Tyr		
275	280	285
His Phe Leu Gly Glu Lys Asp Cys Gly Ala Pro Cys Glu Pro Thr Lys		
290	295	300

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 Ser Ile Trp Trp Val Ile Leu Ser Leu Thr Trp Phe Leu Ala Ala Gly  
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 Met Lys Trp Gly His Glu Ala Ile Glu Ala Asn Ser Gln Tyr Phe His  
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 Leu Ala Ala Trp Ala Val Pro Ala Ile Lys Thr Ile Thr Ile Leu Ala  
 450 455 460  
 Leu Gly Gln Val Asp Gly Asp Val Leu Ser Gly Val Cys Phe Val Gly  
 465 470 475 480  
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 485 490 495  
 Val Tyr Leu Phe Ile Gly Thr Ser Phe Leu Leu Ala Gly Phe Val Ser  
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 Lys Thr Leu Asn Ser Trp Arg Lys Phe Tyr Thr Arg Leu Thr Asn Ser  
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 Lys Gln Gly Glu Thr Thr Val  
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&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 2

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 35                      40                      45  
 Leu Ser Gln Glu Gly Leu Gln Gly Phe Leu Val Glu Ala His Pro Asp  
 50                      55                      60  
 Asn Ala Cys Ser Pro Ile Ala Pro Pro Pro Pro Ala Pro Val Asn Gly  
 65                      70                      75                      80  
 Ser Val Phe Ile Ala Leu Leu Arg Arg Phe Asp Cys Asn Phe Asp Leu  
 85                      90                      95  
 Lys Val Leu Asn Ala Gln Lys Ala Gly Tyr Gly Ala Ala Val Val His  
 100                      105                      110  
 Asn Val Asn Ser Asn Glu Leu Leu Asn Met Val Trp Asn Ser Glu Glu  
 115                      120                      125  
 Ile Gln Gln Gln Ile Trp Ile Pro Ser Val Phe Ile Gly Glu Arg Ser  
 130                      135                      140  
 Ser Glu Tyr Leu Arg Ala Leu Phe Val Tyr Glu Lys Gly Ala Arg Val  
 145                      150                      155                      160

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 Thr Lys Glu Gln Leu Lys Gln Ile Pro Thr His Asp Tyr Gln Lys Gly  
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6/233

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65	70	75
Ser Gln Pro Arg Gly Arg Asp Leu Pro Trp Leu Gly Leu Val Gly Pro		
85	90	95
Ser Gly Leu Trp Thr Ala Asn Thr Leu Cys Cys Phe Trp Lys Ile Pro		
100	105	110
Leu Pro His Pro Cys Leu Ser Pro Ser Ser Pro Pro Thr Leu Arg Ser		
115	120	125
Gly His Pro Ile Pro Phe Gly His Gln Pro Asn Arg Leu Ile Arg Gly		
130	135	140
Trp Lys Leu Gly Gln Arg Arg Arg Val Tyr Pro Leu Val Arg Arg Arg		
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Ala Leu Leu Lys Gly Cys Gly Ala Gly Pro Gly Ala Gly Pro Gly Leu		
165	170	175
Ala Trp Ala Ala Ala Gly Ala Val Val Pro Gly Val Leu Gly Ala Leu		
180	185	190
Gly Pro Ser Trp Pro Ala Val Leu Ala Val Pro Val Pro Leu		
195	200	205

&lt;210&gt; 4

&lt;211&gt; 213

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 4

Met His Tyr Tyr Arg Tyr Ser Asn Ala Lys Val Ser Cys Trp Tyr Lys		
1	5	10
Tyr Leu Leu Phe Ser Tyr Asn Ile Ile Phe Trp Leu Ala Gly Val Val		
20	25	30
Phe Leu Gly Val Gly Leu Trp Ala Trp Ser Glu Lys Gly Val Leu Ser		
35	40	45
Asp Leu Thr Lys Val Thr Arg Met His Gly Ile Asp Pro Val Val Leu		
50	55	60

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Val Leu Met Val Gly Val Val Met Phe Thr Leu Gly Phe Ala Gly Cys  
 65 70 75 80  
 Val Gly Ala Leu Arg Glu Asn Ile Cys Leu Leu Asn Phe Asn Gln Cys  
 85 90 95  
 Cys Gly Ala Tyr Gly Pro Glu Asp Trp Asp Leu Asn Val Tyr Phe Asn  
 100 105 110  
 Cys Ser Gly Ala Ser Tyr Ser Arg Glu Lys Cys Gly Val Pro Phe Ser  
 115 120 125  
 Cys Cys Val Pro Asp Pro Ala Gln Lys Val Val Asn Thr Gln Cys Gly  
 130 135 140  
 Tyr Asp Val Arg Ile Gln Leu Lys Ser Lys Trp Asp Glu Ser Ile Phe  
 145 150 155 160  
 Thr Lys Gly Cys Ile Gln Ala Leu Glu Ser Trp Leu Pro Arg Asn Ile  
 165 170 175  
 Tyr Ile Val Ala Gly Val Phe Ile Ala Ile Ser Leu Leu Gln Ile Phe  
 180 185 190  
 Gly Ile Phe Leu Ala Arg Thr Leu Ile Ser Asp Ile Glu Ala Val Lys  
 195 200 205  
 Ala Gly His His Phe  
 210

&lt;210&gt; 5

&lt;211&gt; 595

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 5

Met Arg Ala Ala Arg Ala Ala Pro Leu Leu Gln Leu Leu Leu Leu  
 1 5 10 15  
 Gly Pro Trp Leu Glu Ala Ala Gly Val Ala Glu Ser Pro Leu Pro Ala  
 20 25 30  
 Val Val Leu Ala Ile Leu Ala Arg Asn Ala Glu His Ser Leu Pro His  
 35 40 45  
 Tyr Leu Gly Ala Leu Glu Arg Leu Asp Tyr Pro Arg Ala Arg Met Ala  
 50 55 60  
 Leu Trp Cys Ala Thr Asp His Asn Val Asp Asn Thr Thr Glu Met Leu

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65	70	75	80
Gln Glu Trp Leu Ala Ala Val Gly Asp Asp Tyr Ala Ala Val Val Trp			
85	90	95	
Arg Pro Glu Gly Glu Pro Arg Phe Tyr Pro Asp Glu Glu Gly Pro Lys			
100	105	110	
His Trp Thr Lys Glu Arg His Gln Phe Leu Met Glu Leu Lys Gln Glu			
115	120	125	
Ala Leu Thr Phe Ala Arg Asn Trp Gly Ala Asp Tyr Ile Leu Phe Ala			
130	135	140	
Asp Thr Asp Asn Ile Leu Thr Asn Asn Gln Thr Leu Arg Leu Leu Met			
145	150	155	160
Gly Gln Gly Leu Pro Val Val Ala Pro Met Leu Asp Ser Gln Thr Tyr			
165	170	175	
Tyr Ser Asn Phe Trp Cys Gly Ile Thr Pro Gln Gly Tyr Tyr Arg Arg			
180	185	190	
Thr Ala Glu Tyr Phe Pro Thr Lys Asn Arg Gln Arg Arg Gly Cys Phe			
195	200	205	
Arg Val Pro Met Val His Ser Thr Phe Leu Ala Ser Leu Arg Ala Glu			
210	215	220	
Gly Ala Asp Gln Leu Ala Phe Tyr Pro Pro His Pro Asn Tyr Thr Trp			
225	230	235	240
Pro Phe Asp Asp Ile Ile Val Phe Ala Tyr Ala Cys Gln Ala Ala Gly			
245	250	255	
Val Ser Val His Val Cys Asn Glu His Arg Tyr Gly Tyr Met Asn Val			
260	265	270	
Pro Val Lys Ser His Gln Gly Leu Glu Asp Glu Arg Val Asn Phe Ile			
275	280	285	
His Leu Ile Leu Glu Ala Leu Val Asp Gly Pro Arg Met Gln Ala Ser			
290	295	300	
Ala His Val Thr Arg Pro Ser Lys Arg Pro Ser Lys Ile Gly Phe Asp			
305	310	315	320
Glu Val Phe Val Ile Ser Leu Ala Arg Arg Pro Asp Arg Arg Glu Arg			
325	330	335	
Met Leu Ala Ser Leu Trp Glu Met Glu Ile Ser Gly Arg Val Val Asp			
340	345	350	

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Ala Val Asp Gly Trp Met Leu Asn Ser Ser Ala Ile Arg Asn Leu Gly  
 355 360 365  
 Val Asp Leu Leu Pro Gly Tyr Gln Asp Pro Tyr Ser Gly Arg Thr Leu  
 370 375 380  
 Thr Lys Gly Glu Val Gly Cys Phe Leu Ser His Tyr Ser Ile Trp Glu  
 385 390 395 400  
 Glu Val Val Ala Arg Gly Leu Ala Arg Val Leu Val Phe Glu Asp Asp  
 405 410 415  
 Val Arg Phe Glu Ser Asn Phe Arg Gly Arg Leu Glu Arg Leu Met Glu  
 420 425 430  
 Asp Val Glu Ala Glu Lys Leu Ser Trp Asp Leu Ile Tyr Leu Gly Arg  
 435 440 445  
 Lys Gln Val Asn Pro Glu Lys Glu Thr Ala Val Glu Gly Leu Pro Gly  
 450 455 460  
 Leu Val Val Ala Gly Tyr Ser Tyr Trp Thr Leu Ala Tyr Ala Leu Arg  
 465 470 475 480  
 Leu Ala Gly Ala Arg Lys Leu Leu Ala Ser Gln Pro Leu Arg Arg Met  
 485 490 495  
 Leu Pro Val Asp Glu Phe Leu Pro Ile Met Phe Asp Gln His Pro Asn  
 500 505 510  
 Glu Gln Tyr Lys Ala His Phe Trp Pro Arg Asp Leu Val Ala Phe Ser  
 515 520 525  
 Ala Gln Pro Leu Leu Ala Ala Pro Thr His Tyr Ala Gly Asp Ala Glu  
 530 535 540  
 Trp Leu Ser Asp Thr Glu Thr Ser Ser Pro Trp Asp Asp Asp Ser Gly  
 545 550 555 560  
 Arg Leu Ile Ser Trp Ser Gly Ser Gln Lys Thr Leu Arg Ser Pro Arg  
 565 570 575  
 Leu Asp Leu Thr Gly Ser Ser Gly His Ser Leu Gln Pro Gln Pro Arg  
 580 585 590  
 Asp Glu Leu  
 595

&lt;210&gt; 6

&lt;211&gt; 264

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&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 6

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Met Val Ala Ser Ala Lys Met Gly Arg Ala Gly Thr Met Ala Val Ala
  1             5             10             15
Ala Glu Leu Arg Glu Leu Cys Pro Gly Val Asn Asn Gln Pro Tyr Leu
      20             25             30
Cys Glu Ser Gly His Cys Cys Gly Glu Thr Gly Cys Cys Thr Tyr Tyr
      35             40             45
Tyr Glu Leu Trp Trp Phe Trp Leu Leu Trp Thr Val Leu Ile Leu Phe
      50             55             60
Ser Cys Cys Cys Ala Phe Arg His Arg Arg Ala Lys Leu Arg Leu Gln
      65             70             75             80
Gln Gln Gln Arg Gln Arg Glu Ile Asn Leu Leu Ala Tyr His Gly Ala
      85             90             95
Cys His Gly Ala Gly Pro Phe Pro Thr Gly Ser Leu Leu Asp Leu Arg
      100            105            110
Phe Leu Ser Thr Phe Lys Pro Pro Ala Tyr Glu Asp Val Val His Arg
      115            120            125
Pro Gly Thr Pro Pro Pro Pro Tyr Thr Val Ala Pro Gly Arg Pro Leu
      130            135            140
Thr Ala Ser Ser Glu Gln Thr Cys Cys Ser Ser Ser Ser Ser Cys Pro
      145            150            155            160
Ala His Phe Glu Gly Thr Asn Val Glu Gly Val Ser Ser His Gln Ser
      165            170            175
Ala Pro Pro His Gln Glu Gly Glu Pro Gly Ala Gly Val Thr Pro Ala
      180            185            190
Ser Thr Pro Pro Ser Cys Arg Tyr Arg Arg Leu Thr Gly Asp Ser Gly
      195            200            205
Ile Glu Leu Cys Pro Cys Pro Ala Ser Gly Glu Gly Glu Pro Val Lys
      210            215            220
Glu Val Arg Val Ser Ala Thr Leu Pro Asp Leu Glu Asp Tyr Ser Pro
      225            230            235            240
Cys Ala Leu Pro Pro Glu Ser Val Pro Gln Ile Phe Pro Met Gly Leu
      245            250            255

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Ser Ser Ser Glu Gly Asp Ile Pro

260

&lt;210&gt; 7

&lt;211&gt; 343

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 7

Met Gln Pro Pro Pro Pro Gly Pro Leu Gly Asp Cys Leu Arg Asp Trp

1 5 10 15

Glu Asp Leu Gln Gln Asp Phe Gln Asn Ile Gln Glu Thr His Arg Leu

20 25 30

Tyr Arg Leu Lys Leu Glu Glu Leu Thr Lys Leu Gln Asn Asn Cys Thr

35 40 45

Ser Ser Ile Thr Arg Gln Lys Lys Arg Leu Gln Glu Leu Ala Leu Ala

50 55 60

Leu Lys Lys Cys Lys Pro Ser Leu Pro Ala Glu Ala Glu Gly Ala Ala

65 70 75 80

Gln Glu Leu Glu Asn Gln Met Lys Glu Arg Gln Gly Leu Phe Phe Asp

85 90 95

Met Glu Ala Tyr Leu Pro Lys Lys Asn Gly Leu Tyr Leu Ser Leu Val

100 105 110

Leu Gly Asn Val Asn Val Thr Leu Leu Ser Lys Gln Ala Lys Phe Ala

115 120 125

Tyr Lys Asp Glu Tyr Glu Lys Phe Lys Leu Tyr Leu Thr Ile Ile Leu

130 135 140

Ile Leu Ile Ser Phe Thr Cys Arg Phe Leu Leu Asn Ser Arg Val Thr

145 150 155 160

Asp Ala Ala Phe Asn Phe Leu Leu Val Trp Tyr Tyr Cys Thr Leu Thr

165 170 175

Ile Arg Glu Ser Ile Leu Ile Asn Asn Gly Ser Arg Ile Lys Gly Trp

180 185 190

Trp Val Phe His His Tyr Val Ser Thr Phe Leu Ser Gly Val Met Leu

195 200 205

Thr Trp Pro Asp Gly Leu Met Tyr Gln Lys Phe Arg Asn Gln Phe Leu



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210	215	220
Ser Phe Ser Met Tyr Gln Ser Phe Val Gln Phe Leu Gln Tyr Tyr Tyr		
225	230	235
Gln Ser Gly Cys Leu Tyr Arg Leu Arg Ala Leu Gly Glu Arg His Thr		
245	250	255
Met Asp Leu Thr Val Glu Gly Phe Gln Ser Trp Met Trp Arg Gly Leu		
260	265	270
Thr Phe Leu Leu Pro Phe Leu Phe Phe Gly His Phe Trp Gln Leu Phe		
275	280	285
Asn Ala Leu Thr Leu Phe Asn Leu Ala Gln Asp Pro Gln Cys Lys Glu		
290	295	300
Trp Gln Val Leu Met Cys Gly Phe Pro Phe Leu Leu Leu Phe Leu Gly		
305	310	315
Asn Phe Phe Thr Thr Leu Arg Val Val His His Lys Phe His Ser Gln		
325	330	335
Arg His Gly Ser Lys Lys Asp		
340		

&lt;210&gt; 8

&lt;211&gt; 244

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 8

Met Asp Ile Leu Val Pro Leu Leu Gln Leu Leu Val Leu Leu Leu Thr		
1	5	10
Leu Pro Leu His Leu Met Ala Leu Leu Gly Cys Trp Gln Pro Leu Cys		
20	25	30
Lys Ser Tyr Phe Pro Tyr Leu Met Ala Val Leu Thr Pro Lys Ser Asn		
35	40	45
Arg Lys Met Glu Ser Lys Lys Arg Glu Leu Phe Ser Gln Ile Lys Gly		
50	55	60
Leu Thr Gly Ala Ser Gly Lys Val Ala Leu Leu Glu Leu Gly Cys Gly		
65	70	75
Thr Gly Ala Asn Phe Gln Phe Tyr Pro Pro Gly Cys Arg Val Thr Cys		
85	90	95

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Leu Asp Pro Asn Pro His Phe Glu Lys Phe Leu Thr Lys Ser Met Ala  
 100 105 110  
 Glu Asn Arg His Leu Gln Tyr Glu Arg Phe Val Val Ala Pro Gly Glu  
 115 120 125  
 Asp Met Arg Gln Leu Ala Asp Gly Ser Met Asp Val Val Val Cys Thr  
 130 135 140  
 Leu Val Leu Cys Ser Val Gln Ser Pro Arg Lys Val Leu Gln Glu Val  
 145 150 155 160  
 Arg Arg Val Leu Arg Pro Gly Gly Val Leu Phe Phe Trp Glu His Val  
 165 170 175  
 Ala Glu Pro Tyr Gly Ser Trp Ala Phe Met Trp Gln Gln Val Phe Glu  
 180 185 190  
 Pro Thr Trp Lys His Ile Gly Asp Gly Cys Cys Leu Thr Arg Glu Thr  
 195 200 205  
 Trp Lys Asp Leu Glu Asn Ala Gln Phe Ser Glu Ile Gln Met Glu Arg  
 210 215 220  
 Gln Pro Pro Pro Leu Lys Trp Leu Pro Val Gly Pro His Ile Met Gly  
 225 230 235 240  
 Lys Ala Val Lys

&lt;210&gt; 9

&lt;211&gt; 303

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 9

Met Lys Leu Lys Leu Lys Asn Val Phe Leu Ala Tyr Phe Leu Val Ser  
 1 5 10 15  
 Ile Ala Gly Leu Leu Tyr Ala Leu Val Gln Leu Gly Gln Pro Cys Asp  
 20 25 30  
 Cys Leu Pro Pro Leu Arg Ala Ala Ala Glu Gln Leu Arg Gln Lys Asp  
 35 40 45  
 Leu Arg Ile Ser Gln Leu Gln Ala Glu Leu Arg Arg Pro Pro Pro Ala  
 50 55 60  
 Pro Ala Gln Pro Pro Glu Pro Glu Ala Leu Pro Thr Ile Tyr Val Val

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65	70	75	80
Thr Pro Thr Tyr Ala Arg Pro Leu Trp Val Gln Tyr Pro Gln Asp Val			
85	90	95	
Thr Thr Phe Asn Ile Asp Asp Gln Tyr Leu Leu Gly Asp Ala Leu Leu			
100	105	110	
Val His Pro Val Ser Asp Ser Gly Ala His Gly Val Gln Val Tyr Leu			
115	120	125	
Pro Gly Gln Gly Glu Val Trp Tyr Asp Ile Gln Ser Tyr Gln Lys His			
130	135	140	
His Gly Pro Gln Thr Leu Tyr Leu Pro Val Thr Leu Ser Ser Ile Pro			
145	150	155	160
Val Phe Gln Arg Gly Gly Thr Ile Val Pro Arg Trp Met Arg Val Arg			
165	170	175	
Arg Ser Ser Glu Cys Met Lys Asp Asp Pro Ile Thr Leu Phe Val Ala			
180	185	190	
Leu Ser Pro Gln Gly Thr Ala Gln Gly Glu Leu Phe Leu Asp Asp Gly			
195	200	205	
His Thr Phe Asn Tyr Gln Thr Arg Gln Glu Phe Leu Leu Arg Arg Phe			
210	215	220	
Ser Phe Ser Gly Asn Thr Leu Val Ser Ser Ser Ala Asp Pro Glu Gly			
225	230	235	240
His Phe Glu Thr Pro Ile Trp Ile Glu Arg Val Val Ile Ile Gly Ala			
245	250	255	
Gly Lys Pro Ala Ala Val Val Leu Gln Thr Lys Gly Ser Pro Glu Ser			
260	265	270	
Arg Leu Ser Phe Gln His Asp Pro Glu Thr Ser Val Leu Val Leu Arg			
275	280	285	
Lys Pro Gly Ile Asn Val Ala Ser Asp Trp Ser Ile His Leu Arg			
290	295	300	

&lt;210&gt; 10

&lt;211&gt; 160

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 10

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Met Asp Lys Leu Lys Lys Val Leu Ser Gly Gln Asp Thr Glu Asp Arg  
 1 5 10 15  
 Ser Gly Leu Ser Glu Val Val Glu Ala Ser Ser Leu Ser Trp Ser Thr  
 20 25 30  
 Arg Ile Lys Gly Phe Ile Ala Cys Phe Ala Ile Gly Ile Leu Cys Ser  
 35 40 45  
 Leu Leu Gly Thr Val Leu Leu Trp Val Pro Arg Lys Gly Leu His Leu  
 50 55 60  
 Phe Ala Val Phe Tyr Thr Phe Gly Asn Ile Ala Ser Ile Gly Ser Thr  
 65 70 75 80  
 Ile Phe Leu Met Gly Pro Val Lys Gln Leu Lys Arg Met Phe Glu Pro  
 85 90 95  
 Thr Arg Leu Ile Ala Thr Ile Met Val Leu Leu Cys Phe Ala Leu Thr  
 100 105 110  
 Leu Cys Ser Ala Phe Trp Trp His Asn Lys Gly Leu Ala Leu Ile Phe  
 115 120 125  
 Cys Ile Leu Gln Ser Leu Ala Leu Thr Trp Tyr Ser Leu Ser Phe Ile  
 130 135 140  
 Pro Phe Ala Arg Asp Ala Val Lys Lys Cys Phe Ala Val Cys Leu Ala  
 145 150 155 160

&lt;210&gt; 11

&lt;211&gt; 1941

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 11

atggetgagg aggaggcgcc taagaagtcc cgggccgccg gcggtggcgc gagctgggaa 60  
 ctttgtgccg gggcgctctc ggcccggtcg acggaggagg gcagcgggga cgccggtggc 120  
 cgccgcgcc cgccagttga ccccgggcga ttggcgcgcc agctgctgct gctgctttgg 180  
 ctgctggagg ctccgctgct gctgggggtc cgggcccgagg cggcgggcca ggggccaggc 240  
 cagggggcccg ggccggggca gcaaccgccg ccgcccctc agcagcaaca gagcgggcag 300  
 cagtacaacg gcgagcgggg catctccgct ccggaccacg gctattgccca gccatctcc 360  
 atcccgtgt gcacggacat cgcgtacaac cagaccatca tgcccaacct gctgggccac 420  
 acgaaccagg aggacgcggg cctggagggtg caccagttct accctctagt gaaagtgcag 480  
 tgttccgctg agctcaagtt ctctctgtgc tccatgtacg cgcccggtg caccgtgcta 540

16/233

gagcagggcg tgcggccctg ccgtccctg tgcgagcgcg cgcgccaggg ctgcgaggcg 600  
 ctcatgaaca agttcggtt ccagtggcca gacacgtca agtgtgagaa gttcccgtg 660  
 cacggcgccg gcgagctgtg cgtgggccag aacacgtccg acaagggcac cccgacgccc 720  
 tcgtctcttc cagagttctg gaccagcaac cctcagcacg gcggcggagg gcaccgtggc 780  
 ggcttcccgg ggggcgcgg cgctcggag cgaggcaagt tctcctgcc gcgcgccctc 840  
 aaggtgccct cctacctcaa ctaccacttc ctgggggaga aggactgcgg cgcaccttgt 900  
 gagccgacca aggtgtatgg gtcattgtac ttccggcccagg aggagctgcg cttctcgcgc 960  
 acctggattg gcatttggtc agtctgtgc tgcgcctcca cgctcttcac ggtgcttacg 1020  
 tacctggtgg acatgcggcg ctccagctac ccggagcggc ccatcatctt cttgtccggc 1080  
 tgttacacgg ccgtggccgt ggctacatc gcgggcttc tcctggaaga ccgagtgtg 1140  
 tgtaatgaca agttcgccga ggacggggca cgcaactgtg cgcagggcac caagaaggag 1200  
 ggtgcacca tcctctcat gatgtctac ttcttcagca tggccagctc catctgtgtg 1260  
 gtgacctgt cgctcacctg gtccctggcg gctggcatga agtggggcca cgaggccatc 1320  
 gaagccaact cacagtattt tcacctggc gcctgggctg tgcggccat caagaccatc 1380  
 accatcctgg cgctgggcca ggtggacggc gatgtgtga gcggagtgtg cttcgtgggg 1440  
 cttacaacg tggacgcgt gcgtggcttc gtgtgggc cctctctctg gtacctgtt 1500  
 atcggcacgt cctttctgt ggccggctt gtgtctct tccgcatccg caccatcatg 1560  
 aagcacgatg gcaccaagac cgagaagctg gagaagctca tggcgcgat tggcgtcttc 1620  
 agcgtgctgt aactgtgac agccaccatc gtcacgcct gctacttcta cgagcaggcc 1680  
 ttccgggacc agtgggaacg cagctgggtg gccagagct gcaagagcta cgctatcccc 1740  
 tgcctcacc tccaggcggg cggaggcgcc ccgcgcacc cggccatgag cccgacttc 1800  
 acggtcttca tgattaaagta cttatgacg ctgacgtgg gcacacgtc gggcttctgg 1860  
 atctggtccg gcaagacct caactcctgg aggaagttct acacgaggct caccaacagc 1920  
 aaacaagggg agactacagt c 1941

&lt;210&gt; 12

&lt;211&gt; 1050

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 12

atgcacctg cagccttccc gcttctgtg gttgtggccg ctgtgctgtg gggagcggcc 60  
 ccgacctggg ggctcattcg agcgacctg gaccacaatg ccagcatgga ctttgacagc 120  
 cttccagctc tgtttggggc taccttgagc caggagggcc tccaggggtt ccttgtggag 180  
 gctcaccag acaatgcctg cagccccatt gccccaccac cccagcccc ggtcaatggg 240  
 tcagtcttta ttgcgtgct tcgaagattc gactgcaact ttgacctcaa ggtcctaaat 300

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gccagaagg ctggatatgg tgccgctgta gtacacaatg tgaattccaa tgaacttctg 360
aacatggtgt ggaatagtga ggaaatccag cagcagatct ggatcccgtc tgtattttatt 420
ggggagagaa gctccgagta cctgcgtgcc ctctttgtct acgagaaggg ggctcgggtg 480
cttctggttc cagacaatac cttccccttg ggctattacc tcatcccttt cacagggtatt 540
gtgggaactgc tggttttggc catgggagca gtaatgatag ctcgttgtat ccagcacccg 600
aaacggctcc agcgggaatcg acttaccaaa gagcaactga aacagattcc tacacatgac 660
tatcagaagg gagaccagta tgatgtctgt gccatttgcc tggatgaata tgaggatggg 720
gacaagctgc gggtaactcc ctgtgtcat gcctaccaca gccgctgcgt ggacccctgg 780
ctcactcaga cccggaagac ctgccccatt tgcaagcagc ctgttcacg gggtcctggg 840
gacgaagacc aagaggaaga aactcaaggg caagaggagg gtgatgaagg ggagccaagg 900
gaccaccctg cctcagaaag gacccactt ttgggtteta gcccactct tcccacctcc 960
tttggttct tagccccagc tcccctgtt ttctctgggc cttcaacaga tccccactg 1020
tcccctccct cttcccctgt taccctggtc 1050

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&lt;210&gt; 13

&lt;211&gt; 618

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 13

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atggggctgg gtcagcccca ggcctggttg ctgggtctgc ccacagctgt ggtctatggc 60
tccctggctc tcttcaccac catcctgcac aatgtcttcc tgetctacta tgtggacacc 120
tttgtctcag tgtacaagat caacaaaatg gccttctggg tcggagagac agtgtttctc 180
ctctggaaca gcctcaatga cccctcttcc ggttggtctc gtgaccggca gttcctcagc 240
tcccagcccc ggggaagaga tctaccctgg cttggcttgg ttggccctc tggactgtgg 300
actgcaaaca cctctgtctg cttctggaag attcctttgc cccatccctg cttgagcccg 360
tcatcaccac caaccttgag aagtgggcat cccataccct ttggccatca gcccaacagg 420
ctaataaggg ggtggaaatt ggggcagagg aggagagtgt acccactggt caggcgccgg 480
gctctcctca agggctgtgg tgetggcccg ggtgcaggcc ctgggctggc atgggcctgt 540
getggcctg tcgttctggt cgttctgggt gccctgggac ccagctggcc tgcagttctt 600
gctgtgctg tgctctca 618

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&lt;210&gt; 14

&lt;211&gt; 639

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

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&lt;400&gt; 14

atgcactatt atagatactc taacgccaag gtcagctgct ggtacaagta cctccttttc	60
agctacaaca tcatcttctg gttggtgga gttgtcttcc ttggagtcgg gctgtgggca	120
tggagcgaaa aggggtgtgt gtcgcacctc accaaagtga cccggatgca tggaaatcgac	180
cctgtggtgc tggtcctgat ggtgggctg gtgatgttca ccctggggtt cgcggctgc	240
gtgggggctc tgcgggagaa tatctgcttg ctcaacttta accagtgtgt tggcgcatat	300
ggccctgaag actgggacct caacgtctac ttcaattgca gcggtgccag ctacagccga	360
gagaagtgcg gggccccctt ctctctgtgc gtgccagatc ctgcgcaaaa agttgtgaac	420
acacagtgtg gatatgatgt caggattcag ctgaagagca agtgggatga gtccatcttc	480
acgaaaggct gcatccaggc gctggaaagc tggtcccgcc ggaacattta cattgtggct	540
ggcgtcttca tcgccatctc gctgttgca atatttgca tcttcctggc aaggacgctg	600
atctcagaca tcgaggcagt gaaggccggc catcacttc	639

&lt;210&gt; 15

&lt;211&gt; 1785

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 15

atgcgcgctg cccgcgcgcg gccgctgtgc cagctgtgtc tcctgtgtgg gccgtggctg	60
gagggtgcgg gcgttgcgga gtgcgcgtg cccgcgctgg tccttgccat cctggccgc	120
aatgccgaac actcgtgtcc ccactacctg ggcgtctctg agcggctgga ctacccccgg	180
gccaggatgg ccctctggtg tgccacggac cacaatgtgg acaacaccac agagatgctg	240
caggagtggc tggcggctgt gggcgtatgac tatgtgtgtg tggctgtgag gcctgagggc	300
gagcccaggt tctaccaga tgaagagggc cccaagcact ggaccaaga aaggcaccag	360
ttctgtatgg agctgaagca ggaagccctc acctttgcca ggaactgggg ggccgactat	420
atcctgtttg cagacacaga caacattctg accaacaatc agactctgcg gcttctcatg	480
gggcaggggc ttccagtggg gggcccaatg ctggactccc agacctacta ctccaacttc	540
tgggtgtgga tcacccccca gggctaactac cgccgcacag ccgagtactt cccaccacag	600
aaccgccagc gccggggctg cttccgtgtc cccatgggtc actccacctt ccttgcatcc	660
ctgcggggctg aaggggcaga ccagcttgct ttctaccgc cacatcccaa ctacacttgg	720
cctttcgacg acatcatcgt cttcgctat gcctgccagg ctgtgggggt ctccgtccac	780
gtgtgcaatg agcaccgtta tgggtacatg aatgtgccgg tgaaatccca ccaggggctg	840
gaagacgaga gggccaactt catccacctg atcttagaag cactagtgga cgccccccgc	900
atgcaggcct cagctcatgt gactcggccc tctaagaggc ccagcaagat agggtttgac	960
gaggctctttg tcatcagcct ggctcgcagg cctgacctc gggaacgcac gctcgcctcg	1020

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ctctgggaga tggagatctc tgggaggggtg gtggacgctg tggatggctg gatgctcaac 1080  
 agcagtgccca tcaggaacct cggcgtagac ctgctcccg gctaccagga cccttactcg 1140  
 ggccgcactc tgaccaaggc cgaggtgggc tgcctcctca gccattactc catctgggaa 1200  
 gaggtggttg ccaggggcct ggcccgggtc ctggtgtttg aggatgacgt gcgctttgag 1260  
 agcaacttca gggggcggct ggagcggctg atggaggatg tggaggcaga gaaactgtct 1320  
 tgggacctga tctacctcg acggaagcag gtgaacctg agaaggagac ggccgtggag 1380  
 gggtgcccgg gcctggtggt ggctgggtac tcctactgga cgctggccta tgcctgcgt 1440  
 ctggcgggtg cccgcaagct gctggcctca cagcctctgc gccgcatgct gcccggtggac 1500  
 gagttcctgc ccatcatgtt cgaccagcac cccaacgagc agtacaaggc acacttctgg 1560  
 ccacgggacc tgggtggcctt ctccgcccag cccctgctcg ctgcccctac ccactatgcc 1620  
 ggggacgccg agtggctcag tgacacggag acatcctctc catgggatga tgacagcggc 1680  
 cgcctcatca gctggagcgg ctcccaaaag accctgcgca gccccgcct ggacctgact 1740  
 ggcagcagcg ggcacagcct ccaaccccag ccccgagatg agctc 1785

&lt;210&gt; 16

&lt;211&gt; 792

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 16

atggtggcct cagcgaagat gggccgggca gggaccatgg cgggtggcagc agagcttcga 60  
 gagctgtgcc caggagtga caaccagccc tacctctgtg agagtggcca ctgctgcggg 120  
 gagactggct gctgcaccta ctactatgag ctctggtggt tctggctgct ctggactgtc 180  
 ctcatcctct ttagctgctg ttgcgccttc cgccaccgac gagctaaact caggctgcaa 240  
 caacagcagc ggcagcgtga aatcaacttg ttggcctatc atggggcatg ccattggggct 300  
 ggtcctttcc ctaccgggtc actgcttgac ctctgcttcc tcagcacctt caagccccca 360  
 gcctacgagg atgtggttca ccgccaggc acaccacccc ccccttatac tgtggcccca 420  
 ggccgcccct tgactgcttc cagtgaacaa acctgctgtt cctcctcatc cagctgccct 480  
 gcccactttg aaggaacaaa tgtggaagggt gttcctccc accagagtgc cccccccat 540  
 caggaggggtg agcccggggc aggggtgacc cctgcctcca cccccctc ctgcgcgtat 600  
 cgcggtttaa ctggcgactc cgggtattgag ctctgccctt gtctgcctc cgggtaggggt 660  
 gagccagtca aggaggtgag ggttagtgcc acctgccag atctggagga ctactccccg 720  
 tgtgcactac cccagagtc tgtaccgag atctttcca tggggctgtc ttccagtga 780  
 ggggacatcc ca 792

&lt;210&gt; 17



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&lt;211&gt; 1029

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 17

```

atgcagcccc cgcccccggg cccgctgggc gactgcctgc gggactggga ggatctacag    60
caggacttcc agaacatcca ggagacccat cggctctacc gcctgaagct ggaggagctg    120
accaaacttc agaacaattg caccagctcc atcacgcggc agaagaagcg gctccaggag    180
ctggccctcg ccctgaagaa atgcaaaccc tccctcccag cagaggccga gggggccgca    240
caggagctgg agaaccagat gaaagagcgc caaggcctct tctttgacat ggaggcctat    300
ttgcctaaga agaatggatt gtacctgagc ctggttctgg ggaacgtcaa cgtcacgctc    360
ctgagcaagc aggctaagtt tgcctacaag gacgagtatg agaagttcaa gctctacctc    420
accatcatcc tcatcctcat ctcttcaact tgccgcttcc tgetcaactc cagggtgaca    480
gatgtgcctt tcaacttcc tctggtctgg tactactgca cctgacccat ccgggagagc    540
atctcatca acaacggctc ccggatcaaa ggctgggtgg tgttccatca ctacgtgtcc    600
accttctgt cgaggatcat gctgacgtgg ccgacggtc tcatgtacca gaaattccgg    660
aaccaattcc tctcttttc catgtaccag agcttctgtc agtttctcca gtactactac    720
cagagcggtt gcctctaccg cctgcggggc ctgggcgagc ggcacaccat ggacctcact    780
gtggagggtt tccagtcctg gatgtggcgg ggctcacct tctgtctgcc ttttcttttc    840
tttggacct tctggcagct ttttaacgcg ctgacgttgt tcaacctggc ccaggacct    900
cagtgcagg agtggcaggt gcttatgtgc ggctttccct tctctctct tttctctggc    960
aatttcttca ccacctgag ggttgtgcac cacaagtttc acagtacgcg gcacgggagc   1020
aagaaggat                                     1029

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&lt;210&gt; 18

&lt;211&gt; 732

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 18

```

atggacatcc tggteccact cctgcagctg ctggtgctgc ttcttacctt gcccctgcac    60
ctcatggctc tgetgggctg ctggcagccc ctgtgcaaaa gctacttccc ctacctgatg    120
gccgtgctga ctcccaagag caaccgcaag atggagagca agaaacggga gctcttcagc    180
cagataaagg ggcttacagg agcctccggg aaagtggccc tactggagct gggctgcgga    240
accggagcca actttcagtt ctaccaccgg ggctgcaggg tcacctgcct agaccctaat    300
ccccactttg agaagttcct gacaaagagc atggctgaga acaggcacct ccaatatgag    360
cggttttggt tggctcctgg agaggacatg agacagctgg ctgatggctc catggatgtg    420

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gtggtctgca ctctggtgct gtgctctgtg cagagcccaa ggaaggctcct gcaggaggtc 480
cggagagtagc tgagaccggg aggtgtgctc tttttctggg agcatgtggc agaaccatat 540
ggaagctggg ccttcatgtg gcagcaagtt ttcgagccca cctggaacaa cattggggat 600
ggctgtgtcc tcaccagaga gacctggaag gatcttgaga acgcccagtt ctccgaaatc 660
caaatggaac gacagccccc tcccttgaag tggctacctg ttgggccccca catcatggga 720
aaggctgtca aa 732

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&lt;210&gt; 19

&lt;211&gt; 909

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 19

```

atgaagctga agctgaagaa cgtgtttctc gcctacttcc tgggtgtgat cgccggcctc 60
ctctacgcgc tggtagagct cggccagcca tgtgactgcc ttctctccct gcgggcagca 120
gccgagcagc tacggcagaa ggatctgagg atttcccagc tgcaagcgga actccgacgg 180
ccacccctct cccctgcccc gcccctgaa cccgaggccc tgcctactat ctatgttgtt 240
acccccacct atgccaggcc cctgtgggtg cagtacctc aggatgtgac taccttcaat 300
atagatgata agtacttget tggggatgag ttgetggttc accctgtatc agactctgga 360
gcccattggtg tccaggtcta tctgcctggc caaggggagg tgtggtatga cattcaaagc 420
taccagaagc atcatggtcc ccagaccctg tacctgctg taactotaag cagtatccct 480
gtgttccagc gtggaggagc aatcgtgctc cgatggatgc gaggcgggc gtcttcagaa 540
tgtatgaagg atgaccccat cactctcttt gttgactta gccctcaggg tacagctcaa 600
ggagagctct ttctggatga tgggcacacg ttcaactatc agactcgcca agagttcctg 660
ctgcgtgat tctcattctc tggcaacacc cttgtctcca gtcagcaga ccctgaagga 720
cactttgaga caccaatctg gattgagcgg gtggtgataa taggggctgg aaagccagca 780
gctgtggtac tccagacaaa aggatctcca gaaagccgcc tgccttcca gcatgacct 840
gagacctctg tgttggctct gcgcaagcct ggcataaatg tggcatctga ttggagtatt 900
cacctgcga 909

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&lt;210&gt; 20

&lt;211&gt; 480

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 20

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atggacaagc tgaagaaggt gctgagcggg caggacacgg aggaccggag cggcctgtcc 60

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gaggttggtg aggcattctt attaatgtgg agtaccagga taaaaggctt cattgcgtgt 120
tttgctatag gaattctctg ctcaactgtg ggtactgttc tgetgtgggt gccaggaag 180
ggactacacc tcttcgcagt gttttatacc tttggtaata tcgcatcaat tgggagtacc 240
atcttcctca tgggaccagt gaaacagctg aagcgaatgt ttgagcctac tcgtttgatt 300
gcaactatca tgggtgctgt gtgttttgca cttaccctgt gttctgcctt ttggtggcat 360
aacaaggagc ttgcacttat cttctgcatt ttgcagtctt tggcattgac gtggtacagc 420
ctttccttca taccatttgc aagggatgct gtgaagaagt gttttgccgt gtgtcttgca 480

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&lt;210&gt; 21

&lt;211&gt; 4485

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (189)...(2132)

&lt;400&gt; 21

```

gaatcgcaag tttccgcggc ggcggcggtt gcggtaacga gaacaggagc cgggggagcg 60
ggccgaaagc ggcttgggct cgacggaggg caccgcgcga gaggtctccc tggccgcagg 120
gggagccgcc gccggccgtg cccctggcag cccagcggga gcggcgccaa gagaggagcc 180
gagaaagt atg gct gag gag gag gcg cct aag aag tcc cgg gcc gcc ggc 230
      Met Ala Glu Glu Glu Ala Pro Lys Lys Ser Arg Ala Ala Gly
          1             5             10
ggt ggc gcg agc tgg gaa ctt tgt gcc ggg gcg ctc tcg gcc cgg ctg 278
Gly Gly Ala Ser Trp Glu Leu Cys Ala Gly Ala Leu Ser Ala Arg Leu
    15             20             25             30
acg gag gag ggc agc ggg gac gcc ggt ggc cgc cgc cgc ccg cca gtt 326
Thr Glu Glu Gly Ser Gly Asp Ala Gly Gly Arg Arg Arg Pro Pro Val
          35             40             45
gac ccc cgg cga ttg gcg cgc cag ctg ctg ctg ctg ctt tgg ctg ctg 374
Asp Pro Arg Arg Leu Ala Arg Gln Leu Leu Leu Leu Leu Trp Leu Leu
          50             55             60
gag gct ccg ctg ctg ctg ggg gtc cgg gcc cag gcg gcg ggc cag ggg 422
Glu Ala Pro Leu Leu Leu Gly Val Arg Ala Gln Ala Ala Gly Gln Gly
          65             70             75
cca ggc cag ggg ccc ggg ccg ggg cag caa ccg ccg ccg cct cag 470

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Pro Gly Gln Gly Pro Gly Pro Gly Gln Gln Pro Pro Pro Pro Pro Gln	
80 85 90	
cag caa cag agc ggg cag cag tac aac ggc gag cgg ggc atc tcc gtc	518
Gln Gln Gln Ser Gly Gln Gln Tyr Asn Gly Glu Arg Gly Ile Ser Val	
95 100 105 110	
ccg gac cac ggc tat tgc cag ccc atc tcc atc ccg ctg tgc acg gac	566
Pro Asp His Gly Tyr Cys Gln Pro Ile Ser Ile Pro Leu Cys Thr Asp	
115 120 125	
atc gcg tac aac cag acc atc atg ccc aac ctg ctg ggc cac acg aac	614
Ile Ala Tyr Asn Gln Thr Ile Met Pro Asn Leu Leu Gly His Thr Asn	
130 135 140	
cag gag gac gcg ggc ctg gag gtg cac cag ttc tac cct cta gtg aaa	662
Gln Glu Asp Ala Gly Leu Glu Val His Gln Phe Tyr Pro Leu Val Lys	
145 150 155	
gtg cag tgt tcc gct gag ctc aag ttc ttc ctg tgc tcc atg tac gcg	710
Val Gln Cys Ser Ala Glu Leu Lys Phe Phe Leu Cys Ser Met Tyr Ala	
160 165 170	
ccc gtg tgc acc gtg cta gag cag gcg ctg ccg ccc tgc cgc tcc ctg	758
Pro Val Cys Thr Val Leu Glu Gln Ala Leu Pro Pro Cys Arg Ser Leu	
175 180 185 190	
tgc gag cgc gcg cgc cag ggc tgc gag gcg ctc atg aac aag ttc ggc	806
Cys Glu Arg Ala Arg Gln Gly Cys Glu Ala Leu Met Asn Lys Phe Gly	
195 200 205	
ttc cag tgg cca gac acg ctc aag tgt gag aag ttc ccg gtg cac ggc	854
Phe Gln Trp Pro Asp Thr Leu Lys Cys Glu Lys Phe Pro Val His Gly	
210 215 220	
gcc ggc gag ctg tgc gtg ggc cag aac acg tcc gac aag ggc acc ccg	902
Ala Gly Glu Leu Cys Val Gly Gln Asn Thr Ser Asp Lys Gly Thr Pro	
225 230 235	
acg ccc tcg ctg ctt cca gag ttc tgg acc agc aac cct cag cac ggc	950
Thr Pro Ser Leu Leu Pro Glu Phe Trp Thr Ser Asn Pro Gln His Gly	
240 245 250	
ggc gga ggg cac cgt ggc ggc ttc ccg ggg ggc gcc ggc gcg tcg gag	998
Gly Gly Gly His Arg Gly Gly Phe Pro Gly Gly Ala Gly Ala Ser Glu	
255 260 265 270	

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cga ggc aag ttc tcc tgc ccg cgc gcc ctc aag gtg ccc tcc tac ctc	1046
Arg Gly Lys Phe Ser Cys Pro Arg Ala Leu Lys Val Pro Ser Tyr Leu	
275 280 285	
aac tac cac ttc ctg ggg gag aag gac tgc ggc gca cct tgt gag ccg	1094
Asn Tyr His Phe Leu Gly Glu Lys Asp Cys Gly Ala Pro Cys Glu Pro	
290 295 300	
acc aag gtg tat ggg ctc atg tac ttc ggg ccc gag gag ctg cgc ttc	1142
Thr Lys Val Tyr Gly Leu Met Tyr Phe Gly Pro Glu Glu Leu Arg Phe	
305 310 315	
tcg cgc acc tgg att ggc att tgg tca gtg ctg tgc tgc gcc tcc acg	1190
Ser Arg Thr Trp Ile Gly Ile Trp Ser Val Leu Cys Cys Ala Ser Thr	
320 325 330	
ctc ttc acg gtg ctt acg tac ctg gtg gac atg cgg cgc ttc agc tac	1238
Leu Phe Thr Val Leu Thr Tyr Leu Val Asp Met Arg Arg Phe Ser Tyr	
335 340 345 350	
ccg gag cgg ccc atc atc ttc ttg tcc ggc tgt tac acg gcc gtg gcc	1286
Pro Glu Arg Pro Ile Ile Phe Leu Ser Gly Cys Tyr Thr Ala Val Ala	
355 360 365	
gtg gcc tac atc gcc ggc ttc ctc ctg gaa gac cga gtg gtg tgt aat	1334
Val Ala Tyr Ile Ala Gly Phe Leu Leu Glu Asp Arg Val Val Cys Asn	
370 375 380	
gac aag ttc gcc gag gac ggg gca cgc act gtg gcg cag gcc acc aag	1382
Asp Lys Phe Ala Glu Asp Gly Ala Arg Thr Val Ala Gln Gly Thr Lys	
385 390 395	
aag gag ggc tgc acc atc ctc ttc atg atg ctc tac ttc ttc agc atg	1430
Lys Glu Gly Cys Thr Ile Leu Phe Met Met Leu Tyr Phe Phe Ser Met	
400 405 410	
gcc agc tcc atc tgg tgg gtg atc ctg tcg ctc acc tgg ttc ctg gcg	1478
Ala Ser Ser Ile Trp Trp Val Ile Leu Ser Leu Thr Trp Phe Leu Ala	
415 420 425 430	
gct ggc atg aag tgg ggc cac gag gcc atc gaa gcc aac tca cag tat	1526
Ala Gly Met Lys Trp Gly His Glu Ala Ile Glu Ala Asn Ser Gln Tyr	
435 440 445	
ttt cac ctg gcc gcc tgg gct gtg ccg gcc atc aag acc atc acc atc	1574
Phe His Leu Ala Ala Trp Ala Val Pro Ala Ile Lys Thr Ile Thr Ile	

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450	455	460	
ctg gcg ctg ggc cag gtg gac ggc gat gtg ctg agc gga gtg tgc ttc			1622
Leu Ala Leu Gly Gln Val Asp Gly Asp Val Leu Ser Gly Val Cys Phe			
465	470	475	
gtg ggg ctt aac aac gtg gac gcg ctg cgt ggc ttc gtg ctg gcg ccc			1670
Val Gly Leu Asn Asn Val Asp Ala Leu Arg Gly Phe Val Leu Ala Pro			
480	485	490	
ctc ttc gtg tac ctg ttt atc ggc acg tcc ttt ctg ctg gcc ggc ttt			1718
Leu Phe Val Tyr Leu Phe Ile Gly Thr Ser Phe Leu Leu Ala Gly Phe			
495	500	505	510
gtg tcg ctc ttc cgc atc cgc acc atc atg aag cac gat ggc acc aag			1766
Val Ser Leu Phe Arg Ile Arg Thr Ile Met Lys His Asp Gly Thr Lys			
515	520	525	
acc gag aag ctg gag aag ctc atg gtg cgc att ggc gtc ttc agc gtg			1814
Thr Glu Lys Leu Glu Lys Leu Met Val Arg Ile Gly Val Phe Ser Val			
530	535	540	
ctg tac act gtg cca gcc acc atc gtc atc gcc tgc tac ttc tac gag			1862
Leu Tyr Thr Val Pro Ala Thr Ile Val Ile Ala Cys Tyr Phe Tyr Glu			
545	550	555	
cag gcc ttc cgg gac cag tgg gaa cgc agc tgg gtg gcc cag agc tgc			1910
Gln Ala Phe Arg Asp Gln Trp Glu Arg Ser Trp Val Ala Gln Ser Cys			
560	565	570	
aag agc tac gct atc ccc tgc cct cac ctc cag gcg ggc gga ggc gcc			1958
Lys Ser Tyr Ala Ile Pro Cys Pro His Leu Gln Ala Gly Gly Gly Ala			
575	580	585	590
ccg ccg cac ccg ccc atg agc ccg gac ttc acg gtc ttc atg att aag			2006
Pro Pro His Pro Pro Met Ser Pro Asp Phe Thr Val Phe Met Ile Lys			
595	600	605	
tac ctt atg acg ctg atc gtg ggc atc acg tog ggc ttc tgg atc tgg			2054
Tyr Leu Met Thr Leu Ile Val Gly Ile Thr Ser Gly Phe Trp Ile Trp			
610	615	620	
tcc ggc aag acc ctc aac tcc tgg agg aag ttc tac acg agg ctc acc			2102
Ser Gly Lys Thr Leu Asn Ser Trp Arg Lys Phe Tyr Thr Arg Leu Thr			
625	630	635	
aac agc aaa caa ggg gag act aca gtc tgagaccgg ggctcagccc a			2150

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Asn Ser Lys Gln Gly Glu Thr Thr Val

640	645	
tgcccaggcc	tcggccgggg	cgcagcgatc ccccaaagcc agcgccgtgg agttegtgcc 2210
aatcctgaca	tctcgagggt	tctcactag acaactctct ttgcaggct cctttgaaca 2270
actcagctcc	tgcaaaagct	tccgtccctg aggcaaaagg acacgagggc ccgactgcc 2330
gagggaggat	ggacagacct	cttgccctca cactctggta ccaggactgt tcgcttttat 2390
gattgtaaat	agcctgtgta	agatttttgt aagtatatatt gtattttaat gacgaccgat 2450
cacgcgtttt	tctttttcaa	aagtttttaa ttatttaggg cggtttaacc atttgaggct 2510
tttctttctt	gcccttttcg	gagtattgca aaggagctaa aactggtgtg caaccgcaca 2570
gcgctcctgg	tcgtcctcgc	gcgcctctcc ctaccacggg tgctcgggac ggctggggcg 2630
cagctccggg	gcgagttcag	cactgcgggg tcgactagg gctgcgctgc cagggtcact 2690
tcccgcctcc	tccttttgcc	ccctcccccct cctctgttcc cctcccttcc tttcctgget 2750
tgaggtaggg	gctcttaagg	tacagaactc cacaaacctt ccaaactctg aggagggccc 2810
ccatacatta	caattcctcc	cttgctcggc ggtggattgc gaaggcccgt cccttcgact 2870
tcctgaagct	ggatttttaa	ctgtccagaa ctttccctca acttcatggg ggcccacggg 2930
tgtgggcgct	ggcagtcctc	gcctccctcc acggtcacct tcaacgccc gacactccct 2990
tctcccacct	tagttgggta	cagggtgagt gagataacca atgccaaact ttttgaagtc 3050
taatttttga	ggggtgagct	catttcattc tctagtgtct aaacctgggt atgggtttgg 3110
ccagcgctcat	ggaaagatgt	ggttactgag atttggggag aagcatgaag ctttgtgtgg 3170
gttggaagag	actgaagata	tgggttataa aatgttaatt ctaattgcat acggatgcct 3230
ggcaaccttg	cctttgagaa	tgagacagcc tgcgcttaga ttttaccggt ctgtaaaatg 3290
gaaatgttga	ggtcacctgg	aaagctttgt taaggagttg atgtttgctt tccttaacaa 3350
gacagcaaaa	cgtaaacaga	aattgaaaac ttgaaggata tttcagtgtc atggacttcc 3410
tcaaatgaa	gtgctatttt	cttattttta atcaataaac tagacatata tcagaaactt 3470
taaaatgtaa	aagttgtaca	ctttcaacat tttattacga ttattattca gcagcacatt 3530
ctgagggggg	aacaattcac	accaccaata ataacctgggt aagatttcag gaggtaaaga 3590
aggtggaata	attgacgggg	agatagcgcc tgaaataaac aaaatatggg catgcatgct 3650
aaagggaaaa	tgtgtgcagg	tctactgcat taaatcctgt gtgctcctct tttggattta 3710
cagaaatgtg	tcaaatgtaa	atctttcaaa gccatttaaa aatattcact ttagttctct 3770
gtgaagaaga	ggagaaaagc	aatcctcctg attgtattgt tttaaacttt aagaatttat 3830
caaaatgccg	gtacttagga	cctaaattta tctatgtctg tcatacgcta aaatgatatt 3890
ggtctttgaa	tttggataac	atttattctg ttcactatca caaaatcctc tatatttata 3950
gaggaataga	agtttatata	tatataatac catattttta atttcacaaa taaaaaattc 4010
aaagttttgt	acaaaattat	atggattttg tgcctgaaaa taatagagct tgagctgtct 4070
gaactatttt	acattttatg	gtgtctcata gccaatccca cagtgtaaaa attcaggaat 4130

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tcaatgaaaa aagtctaccc ttaaaccctc agatcagtct ttccaaagaa ttactctgtt 4190  
 tgcattgttg tgattgacat ttgtgaagtc ccaagaaaag atctgttttc atgacagtag 4250  
 aaaatagaag ttgcaaatt atttctttac tcaaagagga ttaaaagaga actctaattt 4310  
 taatattaaa gctttctttt ctttcagggg ataaatttac atgacttttt atattatgga 4370  
 ggtttatttt taaatcatca cttttctcat attttttaga ggtattgtct tatctcttcc 4430  
 ataatcttgg atattacaaa accctaaata ggcaatcaat aaatggtaa ctggc 4485

&lt;210&gt; 22

&lt;211&gt; 1509

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (253)...(1305)

&lt;400&gt; 22

ttttccgctg tttatccccg taccagaaaa ggatacattt agtgccctcc acccagctcc 60  
 actaaacggg ttggatatct cattotttga gttggtgttc cttccccggc gcccccatgt 120  
 agctgggaag tgggacctgg ggggtggttg acccctggga tcctaaagga ggggcagggg 180  
 ggggcagaaa ctccgcttct gctccttgc accaggacgc gggccctcct cagcctcttt 240  
 cctcccgtg cc atg cac cct gca gcc ttc ccg ctt cct gtg gtt gtg gcc 291

Met His Pro Ala Ala Phe Pro Leu Pro Val Val Val Ala

1

5

10

gct gtg ctg tgg gga gcg gcc ccg acc cgg ggg ctc att cga gcg acc 339  
 Ala Val Leu Trp Gly Ala Ala Pro Thr Arg Gly Leu Ile Arg Ala Thr

15

20

25

tcg gac cac aat gcc agc atg gac ttt gca gac ctt cca gct ctg ttt 387  
 Ser Asp His Asn Ala Ser Met Asp Phe Ala Asp Leu Pro Ala Leu Phe

30

35

40

45

ggg gct acc ttg agc cag gag ggc ctc cag ggg ttc ctt gtg gag gct 435  
 Gly Ala Thr Leu Ser Gln Glu Gly Leu Gln Gly Phe Leu Val Glu Ala

50

55

60

cac cca gac aat gcc tgc agc ccc att gcc cca cca ccc cca gcc ccg 483  
 His Pro Asp Asn Ala Cys Ser Pro Ile Ala Pro Pro Pro Pro Ala Pro

65

70

75

gtc aat ggg tca gtc ttt att gcg ctg ctt cga aga ttc gac tgc aac 531



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Val Asn Gly Ser Val Phe Ile Ala Leu Leu Arg Arg Phe Asp Cys Asn	
80 85 90	
ttt gac ctc aag gtc cta aat gcc cag aag gct gga tat ggt gcc gct	579
Phe Asp Leu Lys Val Leu Asn Ala Gln Lys Ala Gly Tyr Gly Ala Ala	
95 100 105	
gta gta cac aat gtg aat tcc aat gaa ctt ctg aac atg gtg tgg aat	627
Val Val His Asn Val Asn Ser Asn Glu Leu Leu Asn Met Val Trp Asn	
110 115 120 125	
agt gag gaa atc cag cag cag atc tgg atc ccg tct gta ttt att ggg	675
Ser Glu Glu Ile Gln Gln Gln Ile Trp Ile Pro Ser Val Phe Ile Gly	
130 135 140	
gag aga agc tcc gag tac ctg cgt gcc ctc ttt gtc tac gag aag ggg	723
Glu Arg Ser Ser Glu Tyr Leu Arg Ala Leu Phe Val Tyr Glu Lys Gly	
145 150 155	
gct cgg gtg ctt ctg gtt cca gac aat acc ttc ccc ttg ggc tat tac	771
Ala Arg Val Leu Leu Val Pro Asp Asn Thr Phe Pro Leu Gly Tyr Tyr	
160 165 170	
ctc atc cct ttc aca ggg att gtg gga ctg ctg gtt ttg gcc atg gga	819
Leu Ile Pro Phe Thr Gly Ile Val Gly Leu Leu Val Leu Ala Met Gly	
175 180 185	
gca gta atg ata gct cgt tgt atc cag cac cgg aaa cgg ctc cag cgg	867
Ala Val Met Ile Ala Arg Cys Ile Gln His Arg Lys Arg Leu Gln Arg	
190 195 200 205	
aat cga ctt acc aaa gag caa ctg aaa cag att cct aca cat gac tat	915
Asn Arg Leu Thr Lys Glu Gln Leu Lys Gln Ile Pro Thr His Asp Tyr	
210 215 220	
cag aag gga gac cag tat gat gtc tgt gcc att tgc ctg gat gaa tat	963
Gln Lys Gly Asp Gln Tyr Asp Val Cys Ala Ile Cys Leu Asp Glu Tyr	
225 230 235	
gag gat ggg gac aag ctg cgg gta ctc ccc tgt gct cat gcc tac cac	1011
Glu Asp Gly Asp Lys Leu Arg Val Leu Pro Cys Ala His Ala Tyr His	
240 245 250	
agc cgc tgc gtg gac ccc tgg ctc act cag acc cgg aag acc tgc ccc	1059
Ser Arg Cys Val Asp Pro Trp Leu Thr Gln Thr Arg Lys Thr Cys Pro	
255 260 265	

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att tgc aag cag cct gtt cat cgg ggt cct ggg gac gaa gac caa gag      1107
Ile Cys Lys Gln Pro Val His Arg Gly Pro Gly Asp Glu Asp Gln Glu
270                275                280                285
gaa gaa act caa ggg caa gag gag ggt gat gaa ggg gag cca agg gac      1155
Glu Glu Thr Gln Gly Gln Glu Glu Gly Asp Glu Gly Glu Pro Arg Asp
                290                295                300
cac cct gcc tca gaa agg acc cca ctt ttg ggt tot agc ccc act ctt      1203
His Pro Ala Ser Glu Arg Thr Pro Leu Leu Gly Ser Ser Pro Thr Leu
                305                310                315
ccc acc tcc ttt ggt tcc tta gcc cca gct ccc ctt gtt ttt cct ggg      1251
Pro Thr Ser Phe Gly Ser Leu Ala Pro Ala Pro Leu Val Phe Pro Gly
                320                325                330
cct tca aca gat ccc cca ctg tcc cct ccc tct tcc cct gtt atc ctg      1299
Pro Ser Thr Asp Pro Pro Leu Ser Pro Pro Ser Ser Pro Val Ile Leu
                335                340                345
gtc taataacccc ccacacatac acctctggtg acctatttgc acagaccg      1350
Val
350
tcgttttccc tccagtcttc tgagggatag gggacattcc atcccaagct tctcccttac      1410
ccacacctat ccttttgagg ggctttgggg tggggctggg gcaagcagag ggactgggtc      1470
ttcacttctt gggctaataa aattgtttct ttgtggact      1509

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&lt;210&gt; 23

&lt;211&gt; 3059

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (230)...(850)

&lt;400&gt; 23

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cctggtctccc gccagccgtg ggattagget tcgccggeta cgattggggc ccccatcttc      60
tgacttttcc tcgtgtgacc catottttca aattccotta cctgaggaag gagcccgatt      120
acaaggatat ttacctgtc ctacctgat ctagggaaga ggatgggaag accgcctgtg      180
gccatgagcc ctccccggtg ctccctggggc taaggctggg gctgcagcc atg ggg ctg      238
Met Gly Leu

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1

ggt cag ccc cag gcc tgg ttg ctg ggt ctg ccc aca gct gtg gtc tat 286  
 Gly Gln Pro Gln Ala Trp Leu Leu Gly Leu Pro Thr Ala Val Val Tyr  
           5                  10                  15

ggc tcc ctg gct ctc ttc acc acc atc ctg cac aat gtc ttc ctg ctc 334  
 Gly Ser Leu Ala Leu Phe Thr Thr Ile Leu His Asn Val Phe Leu Leu  
           20                  25                  30                  35

tac tat gtg gac acc ttt gtc tca gtg tac aag atc aac aaa atg gcc 382  
 Tyr Tyr Val Asp Thr Phe Val Ser Val Tyr Lys Ile Asn Lys Met Ala  
                           40                  45                  50

ttc tgg gtc gga gag aca gtg ttt ctc ctc tgg aac agc ctc aat gac 430  
 Phe Trp Val Gly Glu Thr Val Phe Leu Leu Trp Asn Ser Leu Asn Asp  
                           55                  60                  65

ccc ctc ttc ggt tgg ctc agt gac cgg cag ttc ctc agc tcc cag ccc 478  
 Pro Leu Phe Gly Trp Leu Ser Asp Arg Gln Phe Leu Ser Ser Gln Pro  
                           70                  75                  80

cgg gga aga gat cta ccc tgg ctt ggc ttg gtt ggc ccc tct gga ctg 526  
 Arg Gly Arg Asp Leu Pro Trp Leu Gly Leu Val Gly Pro Ser Gly Leu  
                           85                  90                  95

tgg act gca aac acc ctc tgc tgc ttc tgg aag att cct ttg ccc cat 574  
 Trp Thr Ala Asn Thr Leu Cys Cys Phe Trp Lys Ile Pro Leu Pro His  
 100                          105                  110                  115

ccc tgc ttg agc ccg tca tca ccc cca acc ttg aga agt ggg cat ccc 622  
 Pro Cys Leu Ser Pro Ser Ser Pro Pro Thr Leu Arg Ser Gly His Pro  
                           120                  125                  130

ata ccc ttt ggc cat cag ccc aac agg cta ata agg ggg tgg aaa ttg 670  
 Ile Pro Phe Gly His Gln Pro Asn Arg Leu Ile Arg Gly Trp Lys Leu  
                           135                  140                  145

ggg cag agg agg aga gtg tac cca ctg gtc agg cgc cgg gct ctc ctc 718  
 Gly Gln Arg Arg Arg Val Tyr Pro Leu Val Arg Arg Arg Ala Leu Leu  
                           150                  155                  160

aag ggc tgt ggt gct ggc ccg ggt gca ggc cct ggg ctg gca tgg gcc 766  
 Lys Gly Cys Gly Ala Gly Pro Gly Ala Gly Pro Gly Leu Ala Trp Ala  
                           165                  170                  175

gct gct ggc gct gtc gtt cct ggc gtt ctg ggt gcc ctg ggc ccc agc 814

Ala Ala Gly Ala Val Pro Gly Val Leu Gly Ala Leu Gly Pro Ser				
180	185	190	195	
tgg cct gca gtt ctt gct gtg cct gtg cct cta tgatggettc ctg				860
Trp Pro Ala Val Leu Ala Val Pro Val Pro Leu				
200	205			
acgtcgtggy acctgcacca ccattgcccttg ctggcccgacc tggccctctc agcccacgac				920
cgcacccacc tcaacttcta ctgctccctc ttccagcgagg ccggetccct ctctgtottt				980
gcatectatg ccttttgga caaggaggat ttctectcct tccgcgttt ctgcgtgaca				1040
ctggctgtca gctctgggct gggctttctg ggggccacac agctgctgag gcggcggtt				1100
gaggcgcccc gaaaggacct aggtgtctca ggcctggttg tggatagcgg cctgtgtgga				1160
gaggagtgc ttgtaggcag tgaggaggcg gacagcatca ccttgggccc gtatctccgg				1220
cagctggcac gccatcgga cttcctgttg ttctgtgaca tggacctggt gcaggtcttc				1280
cactgccact tcaacagcaa cttcttccct ctcttctctg agcatctgtt gtccgacct				1340
atctcccttt ccacgggctc catcctgttg ggctctcct atgtcgtcc ccatctaac				1400
aacctctact tcctgtccct gtgcgggcgc tggggcgctc acgcggtggt gcgggggctc				1460
ttctgtctca agctgggact tagcctgtct atgttgttg ccggcccga ccacctcagc				1520
ctgtgtgccc tcttcattgc cagcaaccgc gtcttctact agggcacctg taagctgctg				1580
accttggttg tcaactgacct ggtagacgag gacctggtgc tgaaccaccg caagcaggca				1640
gcctcggcac tcctcttttg catggttgcc ttggtgacca agccaggcca gacctttgcc				1700
ccgtgtgtgg gcacctggct gctctgttct tacacaggct atgacctctt ccagcagtc				1760
ctcatacccc ctgtggggag tgcccattcc tggccagagc cccagctcc agcccctgca				1820
caggccccga cgctccgcca gggctgcttc tactgtgtgg tgcgtgtgccc catcactgt				1880
gctctgtgct agctcttcac ctggtcccag ttacagctgc atgggagagc cotgcacatg				1940
gtcaaggccc agcgcagaaa cctgtcacag gcccataccc tggatgttaa gatggtgtga				2000
gagctgtggc aaggctaccc cactgaggat gctgctggca gcctggggaa ggagccagtt				2060
ttttttggtt ttttttttaa ggatttcata gttttttttt tttttttttg gagatgttgc				2120
ccaaaaaat ggatctgttg cagtgggtgca atctgggctc actgaaacca ccccccaggt				2180
tcaagcaatt atcctgcctc agcttcccga gtaggtggga ttataggagc gtgccaccat				2240
gcccggctac tttttgtatt tttagtagag acagggtttc atcatgttg ccaggctagt				2300
ctcaaacccc tgacctagg tgatcagccc gcctcgccct cccagagtgc tgggattaca				2360
ggcgtgagcc actgtggcca acctaathtt tgtattattt agtagagaca gggtttcacc				2420
acattggcca ggcgtgtctc gaactcotga cctcaagtga tctgcctgcc ttggtctccc				2480
aaagtgtgg gaatacaggc atgagccacc gcactcggcc aggagctagt tttaccagca				2540
tcctgtctca ctgccttccct ctagtgcage ctggaagaca tggcagcggg tagctcctgg				2600
qqctgagcca gaagcatcac tqcaqtgaaa qtctctgctt acctgtctgg ctcaqcttgg				2660

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gcaagggtctg ggccatatgt gctcagggac gtgcttctct tgtaaggcag gaggatagaa 2720  
 gaggaccaag aaggagaggg gctgccctgt ggtgcacaca ggcctgccat ggggcgtggg 2780  
 agcccatccc gctgcctgac tggagctggc cgctgtgttg gactcaggaa ccacttttaa 2840  
 tactgcaact gctccctttt gccagtcag ggaaagctga ctgtaagtcc cacctccac 2900  
 tccgtccacc cttctagtgg tttctotgag aggtttctct gcttcagctg tgettgaagt 2960  
 ggcattgctc ctctgtgca gggctcccc accccacac ggcctotaaa gatgtttatt 3020  
 tccttataga ctgattaaag tcagccatto tttttctc 3059

&lt;210&gt; 24

&lt;211&gt; 2367

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (69)...(710)

&lt;400&gt; 24

aacttctctg gccgagccgg gccgcgccgc cgctgccgcc gccgcgcgcg gattctgctt 60  
 ctcagaag atg cac tat tat aga tac tct aac gcc aag gtc agc tgc tgg 110  
 Met His Tyr Tyr Arg Tyr Ser Asn Ala Lys Val Ser Cys Trp  
 1 5 10  
 tac aag tac ctc ctt ttc agc tac aac atc atc ttc tgg ttg gct gga 158  
 Tyr Lys Tyr Leu Leu Phe Ser Tyr Asn Ile Ile Phe Trp Leu Ala Gly  
 15 20 25 30  
 gtt gtc ttc ctt gga gtc ggg ctg tgg gca tgg agc gaa aag ggt gtg 206  
 Val Val Phe Leu Gly Val Gly Leu Trp Ala Trp Ser Glu Lys Gly Val  
 35 40 45  
 ctg tcc gac ctc acc aaa gtg acc cgg atg cat gga atc gac cct gtg 254  
 Leu Ser Asp Leu Thr Lys Val Thr Arg Met His Gly Ile Asp Pro Val  
 50 55 60  
 gtg ctg gtc ctg atg gtg ggc gtg gtg atg ttc acc ctg ggg ttc gcc 302  
 Val Leu Val Leu Met Val Gly Val Val Met Phe Thr Leu Gly Phe Ala  
 65 70 75  
 ggc tgc gtg ggg gct ctg cgg gag aat atc tgc ttg ctc aac ttt aac 350  
 Gly Cys Val Gly Ala Leu Arg Glu Asn Ile Cys Leu Leu Asn Phe Asn  
 80 85 90

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cag tgc tgt ggc gca tat ggc cct gaa gac tgg gac ctc aac gtc tac 398  
 Gln Cys Cys Gly Ala Tyr Gly Pro Glu Asp Trp Asp Leu Asn Val Tyr  
 95 100 105 110  
 ttc aat tgc agc ggt gcc agc tac agc cga gag aag tgc ggg gtc ccc 446  
 Phe Asn Cys Ser Gly Ala Ser Tyr Ser Arg Glu Lys Cys Gly Val Pro  
 115 120 125  
 ttc tcc tgc tgc gtg cca gat cct gcg caa aaa gtt gtg aac aca cag 494  
 Phe Ser Cys Cys Val Pro Asp Pro Ala Gln Lys Val Val Asn Thr Gln  
 130 135 140  
 tgt gga tat gat gtc agg att cag ctg aag agc aag tgg gat gag tcc 542  
 Cys Gly Tyr Asp Val Arg Ile Gln Leu Lys Ser Lys Trp Asp Glu Ser  
 145 150 155  
 atc ttc acg aaa ggc tgc atc cag gcg ctg gaa agc tgg ctc ccg cgg 590  
 Ile Phe Thr Lys Gly Cys Ile Gln Ala Leu Glu Ser Trp Leu Pro Arg  
 160 165 170  
 aac att tac att gtg gct ggc gtc ttc atc gcc atc tgc ctg ttg cag 638  
 Asn Ile Tyr Ile Val Ala Gly Val Phe Ile Ala Ile Ser Leu Leu Gln  
 175 180 185 190  
 ata ttt ggc atc ttc ctg gca agg acg ctg atc tca gac atc gag gca 686  
 Ile Phe Gly Ile Phe Leu Ala Arg Thr Leu Ile Ser Asp Ile Glu Ala  
 195 200 205  
 gtg aag gcc ggc cat cac ttc tgaggagcag agttgagggg gccgagctga gcc 740  
 Val Lys Ala Gly His His Phe  
 210  
 acgctgggag gccagagcct ttctctgccca tcagccctac gtccagaggg agaggagccg 800  
 acacccccag agccagtgcc ccatcttaag catcagcgtg acgtgacctc tctgtttctg 860  
 cttgtctggtg ctgaagacca aggggtcccc ttgttacctg cccaaacttg tgactgcac 920  
 cctctggagt ctaccagag acagagaatg tgtctttatg tgggagtggg gactctgaaa 980  
 gacagagagg gctcctgtgg ctgccaggag ggettgactc agacccctg cagctcaagc 1040  
 atgtctgcag gacaccctgg tccctctcc actggcatcc agacatctgc tttgggtcat 1100  
 ccacatctgt ggggtggcgg tgggtagagg gaccacagg cgtggacagg gcactctct 1160  
 ccatcaagca aagcagcatg ggggcctgcc cgtaacggga ggccggacgtg gccccgtgg 1220  
 gcctctgagt gccagcgag tctgctggga catgcacata tcaggggttg tttgcaggat 1280  
 cctcagccat gttcaagtga agtaagcctg agccagtgcg tggactggtg ccacgggagt 1340  
 gccttgcca ctgtccccct gtgtccacca gctattctcc tggcgccgga actgcctctg 1400

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gtcttgatag cattaagccc tgatggcgcc ggtggcgcg gggcatggt tcttcaactga 1460
gagccggctc tccttttctt aaagtgtgta aatagtttat ttataggggt aagaatgttc 1520
tcacaccatt tcaacttctc ttctctctct ccagcattct cctctgagca gccttagata 1580
gtgtccatgg ctggagccga ccctttgagt cccttgagt gtcttaagaa ccagcccaca 1640
acagcctctc tttctctctc acatactgca gcctccctcc atgcatecca catacaagca 1700
ctccccact cccagcgtg gcctcactgt cttctggctt tgggtgctat gaaattgtca 1760
cccagaattt gaatcctgac cctccccact gcaagcccag ggagccccag cccaagatgg 1820
ccagcctgaa actgttgccc agggctctc ttgtggccat gtacccaggg ctggctggcc 1880
tgccatttgc ctctccccgg agacagccgt tctctgcaa ccacaccccg tgcctagcca 1940
caaccccagg ctgcagctgc tcagaagctc caggcatttt gttctgttg accgccccta 2000
atgggatata ggtgatact ggteccacct tcctgtcagg gcttttctgg ggtgctctt 2060
ggaaatgaag tcttaagtac tgaataaetc ccctggggat agctggggca tttgtctagc 2120
tgggctactt tctaactt tgccatagct cagaccactt ctcacgttc agggatggac 2180
tgcaacctta atttacttgc cggagtgtac attctagtgt ggtgtatact ggtggtgtt 2240
gatgatgatt tttttttttt ttttttacac aattctctgt agactaggag aagaatgctt 2300
gtgtttttcg gaagtgtgat gcttctcttt gactgccaaa ctcttttatg gaatatatct 2360
ttatatatt 2367

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&lt;210&gt; 25

&lt;211&gt; 2355

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (20)...(1807)

&lt;400&gt; 25

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agccgcccaa gcgccgcc atg cgc gct gcc cgc gcc gcg ccg ctg ctc cag 52
Met Arg Ala Ala Arg Ala Ala Pro Leu Leu Gln
1 5 10
ctg ctg ctc ctg ctg ggg ccg tgg ctg gag gct gcg gcc gtt gcg gag 100
Leu Leu Leu Leu Leu Gly Pro Trp Leu Glu Ala Ala Gly Val Ala Glu
15 20 25
tcg ccg ctg ccc gcc gtg gtc ctt gcc atc ctg gcc cgc aat gcc gaa 148
Ser Pro Leu Pro Ala Val Val Leu Ala Ile Leu Ala Arg Asn Ala Glu
30 35 40

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cac tcg ctg ccc cac tac ctg ggc gct ctg gag cgg ctg gac tac ccc	196
His Ser Leu Pro His Tyr Leu Gly Ala Leu Glu Arg Leu Asp Tyr Pro	
45 50 55	
cgg gcc agg atg gcc ctc tgg tgt gcc acg gac cac aat gtg gac aac	244
Arg Ala Arg Met Ala Leu Trp Cys Ala Thr Asp His Asn Val Asp Asn	
60 65 70 75	
acc aca gag atg ctg cag gag tgg ctg gcg gct gtg ggc gat gac tat	292
Thr Thr Glu Met Leu Gln Glu Trp Leu Ala Ala Val Gly Asp Asp Tyr	
80 85 90	
gct gct gtg gtc tgg agg cct gag ggc gag ccc agg ttc tac cca gat	340
Ala Ala Val Val Trp Arg Pro Glu Gly Glu Pro Arg Phe Tyr Pro Asp	
95 100 105	
gaa gag ggt ccc aag cac tgg acc aaa gaa agg cac cag ttt ctg atg	388
Glu Glu Gly Pro Lys His Trp Thr Lys Glu Arg His Gln Phe Leu Met	
110 115 120	
gag ctg aag cag gaa gcc ctc acc ttt gcc agg aac tgg ggg gcc gac	436
Glu Leu Lys Gln Glu Ala Leu Thr Phe Ala Arg Asn Trp Gly Ala Asp	
125 130 135	
tat atc ctg ttt gca gac aca gac aac att ctg acc aac aat cag act	484
Tyr Ile Leu Phe Ala Asp Thr Asp Asn Ile Leu Thr Asn Asn Gln Thr	
140 145 150 155	
ctg cgg ctt ctc atg ggg cag ggg ctt cca gtg gtg gcc cca atg ctg	532
Leu Arg Leu Leu Met Gly Gln Gly Leu Pro Val Val Ala Pro Met Leu	
160 165 170	
gac tcc cag acc tac tac tcc aac ttc tgg tgt ggg atc acc ccc cag	580
Asp Ser Gln Thr Tyr Tyr Ser Asn Phe Trp Cys Gly Ile Thr Pro Gln	
175 180 185	
ggc tac tac cgc cgc aca gcc gag tac ttc ccc acc aag aac cgc cag	628
Gly Tyr Tyr Arg Arg Thr Ala Glu Tyr Phe Pro Thr Lys Asn Arg Gln	
190 195 200	
cgc cgg ggc tgc ttc cgt gtc ccc atg gtc cac tcc acc ttc ctt gca	676
Arg Arg Gly Cys Phe Arg Val Pro Met Val His Ser Thr Phe Leu Ala	
205 210 215	
tcc ctg cgg gct gaa ggg gca gac cag ctt gct ttc tac ccg cca cat	724
Ser Leu Arg Ala Glu Gly Ala Asp Gln Leu Ala Phe Tyr Pro Pro His	



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220	225	230	235	
ccc aac tac act tgg cct ttc gac gac atc atc gtc ttc gcc tat gcc				772
Pro Asn Tyr Thr Trp Pro Phe Asp Asp Ile Ile Val Phe Ala Tyr Ala				
	240	245	250	
tgc cag gct gct ggg gtc tcc gtc cac gtg tgc aat gag cac cgt tat				820
Cys Gln Ala Ala Gly Val Ser Val His Val Cys Asn Glu His Arg Tyr				
	255	260	265	
ggg tac atg aat gtg ccg gtg aaa tcc cac cag ggg ctg gaa gac gag				868
Gly Tyr Met Asn Val Pro Val Lys Ser His Gln Gly Leu Glu Asp Glu				
	270	275	280	
agg gtc aac ttc atc cac ctg atc tta gaa gca cta gtg gac ggc ccc				916
Arg Val Asn Phe Ile His Leu Ile Leu Glu Ala Leu Val Asp Gly Pro				
	285	290	295	
cgc atg cag gcc tca gct cat gtg act cgg ccc tct aag agg ccc agc				964
Arg Met Gln Ala Ser Ala His Val Thr Arg Pro Ser Lys Arg Pro Ser				
300	305	310	315	
aag ata ggg ttt gac gag gtc ttt gtc atc agc ctg gct cgc agg cct				1012
Lys Ile Gly Phe Asp Glu Val Phe Val Ile Ser Leu Ala Arg Arg Pro				
	320	325	330	
gac cgt cgg gaa cgc atg ctc gcc tcg ctc tgg gag atg gag atc tct				1060
Asp Arg Arg Glu Arg Met Leu Ala Ser Leu Trp Glu Met Glu Ile Ser				
	335	340	345	
ggg agg gtg gtg gac gct gtg gat ggc tgg atg ctc aac agc agt gcc				1108
Gly Arg Val Val Asp Ala Val Asp Gly Trp Met Leu Asn Ser Ser Ala				
	350	355	360	
atc agg aac ctc ggc gta gac ctg ctc ccg ggc tac cag gac cct tac				1156
Ile Arg Asn Leu Gly Val Asp Leu Leu Pro Gly Tyr Gln Asp Pro Tyr				
	365	370	375	
tcg ggc cgc act ctg acc aag ggc gag gtg ggc tgc ttc ctc agc cat				1204
Ser Gly Arg Thr Leu Thr Lys Gly Glu Val Gly Cys Phe Leu Ser His				
380	385	390	395	
tac tcc atc tgg gaa gag gtg gtt gcc agg ggc ctg gcc cgg gtc ctg				1252
Tyr Ser Ile Trp Glu Glu Val Val Ala Arg Gly Leu Ala Arg Val Leu				
	400	405	410	
gtg ttt gag gat gac gtg cgc ttt gag agc aac ttc agg ggg cgg ctg				1300

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Val Phe Glu Asp Asp Val Arg Phe Glu Ser Asn Phe Arg Gly Arg Leu	
415 420 425	
gag cgg ctg atg gag gat gtg gag gca gag aaa ctg tct tgg gac ctg	1348
Glu Arg Leu Met Glu Asp Val Glu Ala Glu Lys Leu Ser Trp Asp Leu	
430 435 440	
atc tac ctc gga cgg aag cag gtg aac cct gag aag gag acg gcc gtg	1396
Ile Tyr Leu Gly Arg Lys Gln Val Asn Pro Glu Lys Glu Thr Ala Val	
445 450 455	
gag ggg ctg ccg ggc ctg gtg gtg gct ggg tac tcc tac tgg acg ctg	1444
Glu Gly Leu Pro Gly Leu Val Val Ala Gly Tyr Ser Tyr Trp Thr Leu	
460 465 470 475	
gcc tat gcc ctg cgt ctg gcg ggt gcc cgc aag ctg ctg gcc tca cag	1492
Ala Tyr Ala Leu Arg Leu Ala Gly Ala Arg Lys Leu Leu Ala Ser Gln	
480 485 490	
cct ctg cgc cgc atg ctg ccc gtg gac gag ttc ctg ccc atc atg ttc	1540
Pro Leu Arg Arg Met Leu Pro Val Asp Glu Phe Leu Pro Ile Met Phe	
495 500 505	
gac cag cac ccc aac gag cag tac aag gca cac ttc tgg cca cgg gac	1588
Asp Gln His Pro Asn Glu Gln Tyr Lys Ala His Phe Trp Pro Arg Asp	
510 515 520	
ctg gtg gcc ttc tcc gcc cag ccc ctg ctc gct gcc cct acc cac tat	1636
Leu Val Ala Phe Ser Ala Gln Pro Leu Leu Ala Ala Pro Thr His Tyr	
525 530 535	
gcc ggg gac gcc gag tgg ctc agt gac acg gag aca tcc tct cca tgg	1684
Ala Gly Asp Ala Glu Trp Leu Ser Asp Thr Glu Thr Ser Ser Pro Trp	
540 545 550 555	
gat gat gac agc ggc cgc ctc atc agc tgg agc ggc tcc caa aag acc	1732
Asp Asp Asp Ser Gly Arg Leu Ile Ser Trp Ser Gly Ser Gln Lys Thr	
560 565 570	
ctg cgc agc ccc cgc ctg gac ctg act ggc agc agc ggg cac agc ctc	1780
Leu Arg Ser Pro Arg Leu Asp Leu Thr Gly Ser Ser Gly His Ser Leu	
575 580 585	
caa ccc cag ccc cga gat gag ctc taggtccagg tgaatgactgc aaagca	1830
Gln Pro Gln Pro Arg Asp Glu Leu	
590 595	

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gtgtccagga gcaggccact actgccaga gageagagga ggaggttgtt ggcagggact 1890
gcagatcctg tcagacctgg ccaccacett gggcatggcc actctgccct ctggacctgt 1950
ctttcatcgg gagaaaccac tcagagatgg atcccattcc ctaaaggtct cacagcaaag 2010
gagcaggact cccaggcccc tgtaccctgc ctggcctgat tcagggcett gtggcccca 2070
gcttctgttt caagctgggc agaccccagg atcccttccc tccctaagga ctcagctgag 2130
gggcccctct gccccttct acctccacct cagcaccctc cccagcttg atgtttgggt 2190
ctccccagca ccctctccc tggccggtgc aaagtacagg gaggtaaagc aggacccttg 2250
cagacatgtt gccagcaca cagtaggccc tcaataaaag ccatttgac tttaaatata 2310
tatatgtatg tatatatatg tatatatata tatatatata tatgt 2355

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&lt;210&gt; 26

&lt;211&gt; 1024

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (27)...(821)

&lt;400&gt; 26

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cggatggaag ctccggccgc ggagtg atg gtg gcc tca gcg aag atg ggc cgg 53
                               Met Val Ala Ser Ala Lys Met Gly Arg
                               1             5

gca ggg acc atg gcg gtg gca gca gag ctt cga gag ctg tgc cca gga 101
Ala Gly Thr Met Ala Val Ala Ala Glu Leu Arg Glu Leu Cys Pro Gly
 10             15             20             25

gtg aac aac cag ccc tac ctc tgt gag agt ggt cac tgc tgc ggg gag 149
Val Asn Asn Gln Pro Tyr Leu Cys Glu Ser Gly His Cys Cys Gly Glu
 30             35             40

act ggc tgc tgc acc tac tac tat gag ctc tgg tgg ttc tgg ctg ctc 197
Thr Gly Cys Cys Thr Tyr Tyr Tyr Glu Leu Trp Trp Phe Trp Leu Leu
 45             50             55

tgg act gtc ctc atc ctc ttt agc tgc tgt tgc gcc ttc cgc cac cga 245
Trp Thr Val Leu Ile Leu Phe Ser Cys Cys Cys Ala Phe Arg His Arg
 60             65             70

cga gct aaa ctc agg ctg caa caa cag cag cgg cag cgt gaa atc aac 293
Arg Ala Lys Leu Arg Leu Gln Gln Gln Gln Arg Gln Arg Glu Ile Asn

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75	80	85	
ttg ttg gcc tat cat ggg gca tgc cat ggg gct ggt cct ttc cct acc			341
Leu Leu Ala Tyr His Gly Ala Cys His Gly Ala Gly Pro Phe Pro Thr			
90	95	100	105
ggg tca ctg ctt gac ctt cgc ttc ctc agc acc ttc aag ccc cca gcc			389
Gly Ser Leu Leu Asp Leu Arg Phe Leu Ser Thr Phe Lys Pro Pro Ala			
110	115	120	
tac gag gat gtg gtt cac cgc cca ggc aca cca ccc ccc cct tat act			437
Tyr Glu Asp Val Val His Arg Pro Gly Thr Pro Pro Pro Pro Tyr Thr			
125	130	135	
gtg gcc cca ggc cgc ccc ttg act gct tcc agt gaa caa acc tgc tgt			485
Val Ala Pro Gly Arg Pro Leu Thr Ala Ser Ser Glu Gln Thr Cys Cys			
140	145	150	
tcc tcc tca tcc agc tgc cct gcc cac ttt gaa gga aca aat gtg gaa			533
Ser Ser Ser Ser Ser Cys Pro Ala His Phe Glu Gly Thr Asn Val Glu			
155	160	165	
ggg gtt tcc tcc cac cag agt gcc ccc ccc cat cag gag ggt gag ccc			581
Gly Val Ser Ser His Gln Ser Ala Pro Pro His Gln Glu Gly Glu Pro			
170	175	180	185
ggg gca ggg gtg acc cct gcc tcc aca ccc ccc tcc tgc cgc tat cgc			629
Gly Ala Gly Val Thr Pro Ala Ser Thr Pro Pro Ser Cys Arg Tyr Arg			
190	195	200	
cgt tta act ggc gac tcc ggt att gag ctc tgc cct tgt cct gcc tcc			677
Arg Leu Thr Gly Asp Ser Gly Ile Glu Leu Cys Pro Cys Pro Ala Ser			
205	210	215	
ggg gag ggt gag cca gtc aag gag gtg agg gtt agt gcc acc ctg cca			725
Gly Glu Gly Glu Pro Val Lys Glu Val Arg Val Ser Ala Thr Leu Pro			
220	225	230	
gat ctg gag gac tac tcc ccg tgt gca cta ccc cca gag tct gta ccg			773
Asp Leu Glu Asp Tyr Ser Pro Cys Ala Leu Pro Pro Glu Ser Val Pro			
235	240	245	
cag atc ttt ccc atg ggg ctg tct tcc agt gaa ggg gac atc cca			818
Gln Ile Phe Pro Met Gly Leu Ser Ser Ser Glu Gly Asp Ile Pro			
250	255	260	
ta agtagttttg agagggtgga tgggttactt gccaccaga aacagcccta			870

40/233

gtcccaactc cttgcgttcc tttggcccct ccctgcctac ctagaatctg cctgaaaggg 930  
 ctggagaggg gcagtattgg gggactgtgc tagctttacc cccgcaggac atacacagga 990  
 gcctttgatc tcattaaaga gatgtgaacc agct 1024

&lt;210&gt; 27

&lt;211&gt; 1237

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (24)...(1055)

&lt;400&gt; 27

tactggetac tggcgetgca gcc atg cag ccc ccg ccc ccg ggc ccg ctg ggc 53  
 Met Gln Pro Pro Pro Pro Gly Pro Leu Gly  
 1 5 10  
 gac tgc ctg cgg gac tgg gag gat cta cag cag gac ttc cag aac atc 101  
 Asp Cys Leu Arg Asp Trp Glu Asp Leu Gln Gln Asp Phe Gln Asn Ile  
 15 20 25  
 cag gag acc cat cgg ctc tac cgc ctg aag ctg gag gag ctg acc aaa 149  
 Gln Glu Thr His Arg Leu Tyr Arg Leu Lys Leu Glu Glu Leu Thr Lys  
 30 35 40  
 ctt cag aac aat tgc acc agc tcc atc acg cgg cag aag aag cgg ctc 197  
 Leu Gln Asn Asn Cys Thr Ser Ser Ile Thr Arg Gln Lys Lys Arg Leu  
 45 50 55  
 cag gag ctg gcc ctc gcc ctg aag aaa tgc aaa ccc tcc ctc cca gca 245  
 Gln Glu Leu Ala Leu Ala Leu Lys Lys Cys Lys Pro Ser Leu Pro Ala  
 60 65 70  
 gag gcc gag ggg gcc gca cag gag ctg gag aac cag atg aaa gag cgc 293  
 Glu Ala Glu Gly Ala Ala Gln Glu Leu Glu Asn Gln Met Lys Glu Arg  
 75 80 85 90  
 caa ggc ctc ttc ttt gac atg gag gcc tat ttg cct aag aag aat gga 341  
 Gln Gly Leu Phe Phe Asp Met Glu Ala Tyr Leu Pro Lys Lys Asn Gly  
 95 100 105  
 ttg tac ctg agc ctg gtt ctg ggg aac gtc aac gtc acg ctc ctg agc 389  
 Leu Tyr Leu Ser Leu Val Leu Gly Asn Val Asn Val Thr Leu Leu Ser

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110	115	120	
aag cag gct aag ttt gcc tac aag gac gag tat gag aag ttc aag ctc			437
Lys Gln Ala Lys Phe Ala Tyr Lys Asp Glu Tyr Glu Lys Phe Lys Leu			
125	130	135	
tac ctc acc atc atc ctc atc ctc atc tcc ttc act tgc cgc ttc ctg			485
Tyr Leu Thr Ile Ile Leu Ile Leu Ile Ser Phe Thr Cys Arg Phe Leu			
140	145	150	
ctc aac tcc agg gtg aca gat gct gcc ttc aac ttc ctg ctg gtc tgg			533
Leu Asn Ser Arg Val Thr Asp Ala Ala Phe Asn Phe Leu Leu Val Trp			
155	160	165	170
tac tac tgc acc ctg acc atc cgg gag agc atc ctc atc aac aac ggc			581
Tyr Tyr Cys Thr Leu Thr Ile Arg Glu Ser Ile Leu Ile Asn Asn Gly			
175	180	185	
tcc cgg atc aaa ggc tgg tgg gtg ttc cat cac tac gtg tcc acc ttc			629
Ser Arg Ile Lys Gly Trp Trp Val Phe His His Tyr Val Ser Thr Phe			
190	195	200	
ctg tcg gga gtc atg ctg acg tgg ccc gac ggt ctc atg tac cag aaa			677
Leu Ser Gly Val Met Leu Thr Trp Pro Asp Gly Leu Met Tyr Gln Lys			
205	210	215	
ttc cgg aac caa ttc ctc tcc ttt tcc atg tac cag agc ttc gtg cag			725
Phe Arg Asn Gln Phe Leu Ser Phe Ser Met Tyr Gln Ser Phe Val Gln			
220	225	230	
ttt ctc cag tac tac tac cag agc ggc tgc ctc tac cgc ctg cgg gcg			773
Phe Leu Gln Tyr Tyr Tyr Gln Ser Gly Cys Leu Tyr Arg Leu Arg Ala			
235	240	245	250
ctg ggc gag cgg cac acc atg gac ctc act gtg gag ggc ttc cag tcc			821
Leu Gly Glu Arg His Thr Met Asp Leu Thr Val Glu Gly Phe Gln Ser			
255	260	265	
tgg atg tgg cgg ggc ctc acc ttc ctg ctg cct ttt ctt ttc ttt gga			869
Trp Met Trp Arg Gly Leu Thr Phe Leu Leu Pro Phe Leu Phe Phe Gly			
270	275	280	
cac ttc tgg cag ctt ttt aac gcg ctg acg ttg ttc aac ctg gcc cag			917
His Phe Trp Gln Leu Phe Asn Ala Leu Thr Leu Phe Asn Leu Ala Gln			
285	290	295	
gac cct cag tgc aag gag tgg cag gtg ctt atg tgc ggc ttt ccc ttc			965

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Asp Pro Gln Cys Lys Glu Trp Gln Val Leu Met Cys Gly Phe Pro Phe  
 300 305 310  
 ctc ctc ctt ttc ctc ggc aat ttc ttc acc acc ctg agg gtt gtg cac 1013  
 Leu Leu Leu Phe Leu Gly Asn Phe Phe Thr Thr Leu Arg Val Val His  
 315 320 325 330  
 cac aag ttt cac agt cag cgg cac ggg agc aag aag gat tgaggctg 1060  
 His Lys Phe His Ser Gln Arg His Gly Ser Lys Lys Asp  
 335 340  
 ggccttcccc tgccggccca gaggggcttc tgcctgtgt gttgtgggag gggatgggag 1120  
 gcgcccctcg agtgtgcgtg taccaggggg tctcttatat tctcccttgg gttttatggg 1180  
 cgctgtgggc cctgaaggaa gacctgggcc cagtgccttc aataaagaga ggcccag 1237

<210> 28  
 <211> 1332  
 <212> DNA  
 <213> Homo sapiens  
 <220>  
 <221> CDS  
 <222> (39)...(773)  
 <400> 28

agtgcgccag cggaagcaca gotcagagot ggtctgcc atg gac atc ctg gtc cca 56  
 Met Asp Ile Leu Val Pro  
 1 5  
 ctc ctg cag ctg ctg gtg ctg ctt ctt acc ctg ccc ctg cac ctc atg 104  
 Leu Leu Gln Leu Leu Val Leu Leu Leu Thr Leu Pro Leu His Leu Met  
 10 15 20  
 got ctg ctg ggc tgc tgg cag ccc ctg tgc aaa agc tac ttc ccc tac 152  
 Ala Leu Leu Gly Cys Trp Gln Pro Leu Cys Lys Ser Tyr Phe Pro Tyr  
 25 30 35  
 ctg atg gcc gtg ctg act ccc aag agc aac cgc aag atg gag agc aag 200  
 Leu Met Ala Val Leu Thr Pro Lys Ser Asn Arg Lys Met Glu Ser Lys  
 40 45 50  
 aaa cgg gag ctc ttc agc cag ata aag ggg ctt aca gga gcc tcc ggg 248  
 Lys Arg Glu Leu Phe Ser Gln Ile Lys Gly Leu Thr Gly Ala Ser Gly  
 55 60 65 70

43/233

aaa gtg gcc cta ctg gag ctg ggc tgc gga acc gga gcc aac ttt cag	296
Lys Val Ala Leu Leu Glu Leu Gly Cys Gly Thr Gly Ala Asn Phe Gln	
75 80 85	
ttc tac cca ccg ggc tgc agg gtc acc tgc cta gac cca aat ccc cac	344
Phe Tyr Pro Pro Gly Cys Arg Val Thr Cys Leu Asp Pro Asn Pro His	
90 95 100	
ttt gag aag ttc ctg aca aag agc atg gct gag aac agg cac ctc caa	392
Phe Glu Lys Phe Leu Thr Lys Ser Met Ala Glu Asn Arg His Leu Gln	
105 110 115	
tat gag cgg ttt gtg gtg gct cct gga gag gac atg aga cag ctg gct	440
Tyr Glu Arg Phe Val Val Ala Pro Gly Glu Asp Met Arg Gln Leu Ala	
120 125 130	
gat ggc tcc atg gat gtg gtg gtc tgc act ctg gtg ctg tgc tct gtg	488
Asp Gly Ser Met Asp Val Val Val Cys Thr Leu Val Leu Cys Ser Val	
135 140 145 150	
cag agc cca agg aag gtc ctg cag gag gtc cgg aga gta ctg aga ccg	536
Gln Ser Pro Arg Lys Val Leu Gln Glu Val Arg Arg Val Leu Arg Pro	
155 160 165	
gga ggt gtg ctc ttt ttc tgg gag cat gtg gca gaa cca tat gga agc	584
Gly Gly Val Leu Phe Phe Trp Glu His Val Ala Glu Pro Tyr Gly Ser	
170 175 180	
tgg gcc ttc atg tgg cag caa gtt ttc gag ccc acc tgg aaa cac att	632
Trp Ala Phe Met Trp Gln Gln Val Phe Glu Pro Thr Trp Lys His Ile	
185 190 195	
ggg gat ggc tgc tgc ctc acc aga gag acc tgg aag gat ctt gag aac	680
Gly Asp Gly Cys Cys Leu Thr Arg Glu Thr Trp Lys Asp Leu Glu Asn	
200 205 210	
gcc cag ttc tcc gaa atc caa atg gaa cga cag ccc cct ccc ttg aag	728
Ala Gln Phe Ser Glu Ile Gln Met Glu Arg Gln Pro Pro Pro Leu Lys	
215 220 225 230	
tgg cta cct gtt ggg ccc cac atc atg gga aag gct gtc aaa taatcttcc	780
Trp Leu Pro Val Gly Pro His Ile Met Gly Lys Ala Val Lys	
235 240	
caagctccaa ggcaactcatt tgctccttcc ccagcctcca attagaacaa gccaccacc	840
agcctatcta tcttccactg agagggacct agcagaatga gagaagacat tcattgtacca	900



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cctactagtc cctctctccc caacctctgc cagggcaatc tetaacttca atcccgcctt 960  
 cgacagtcaa aaagctctac ttctacgtg acccagggag gaaacactag gaccctgttg 1020  
 tatectcaac tgcaagtttc tggactagtc tcccaacgtt tgcctcccaa tgttgtccct 1080  
 ttctctcgtt cccatggtaa agctcctctc gctttcctcc tgaggetaca cccatgcgtc 1140  
 tctaggaact ggtcacaaaa gtcattggtgc ctgcatecct gccaaagccc cctgaccctc 1200  
 tctccccact accaccttct tcctgagctg ggggcaccag ggagaatcag agatgctggg 1260  
 gatgccagag caagactcaa agaggcagag gttttgttct caaatatttt ttaataaata 1320  
 gacgaaacca cg 1332

&lt;210&gt; 29

&lt;211&gt; 1932

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (38)...(949)

&lt;400&gt; 29

agaccccgcc tgctcgggcg cgggcggcgg cgcggcc atg aag ctg aag ctg aag 55  
 Met Lys Leu Lys Leu Lys  
 1 5  
 aac gtg ttt ctc gcc tac ttc ctg gtg tcg atc gcc ggc ctc ctc tac 103  
 Asn Val Phe Leu Ala Tyr Phe Leu Val Ser Ile Ala Gly Leu Leu Tyr  
 10 15 20  
 gcg ctg gta cag ctc ggc cag cca tgt gac tgc ctt cct ccc ctg cgg 151  
 Ala Leu Val Gln Leu Gly Gln Pro Cys Asp Cys Leu Pro Pro Leu Arg  
 25 30 35  
 gca gca gcc gag cag cta cgg cag aag gat ctg agg att tcc cag ctg 199  
 Ala Ala Ala Glu Gln Leu Arg Gln Lys Asp Leu Arg Ile Ser Gln Leu  
 40 45 50  
 caa gcg gaa ctc cga cgg cca ccc cct gcc cct gcc cag ccc cct gaa 247  
 Gln Ala Glu Leu Arg Arg Pro Pro Pro Ala Pro Ala Gln Pro Pro Glu  
 55 60 65 70  
 ccc gag gcc ctg cct act atc tat gtt gtt acc ccc acc tat gcc agg 295  
 Pro Glu Ala Leu Pro Thr Ile Tyr Val Val Thr Pro Thr Tyr Ala Arg  
 75 80 85

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ccc ctg tgg gtg cag tac cct cag gat gtg act acc ttc aat ata gat	343
Pro Leu Trp Val Gln Tyr Pro Gln Asp Val Thr Thr Phe Asn Ile Asp	
90 95 100	
gat cag tac ttg ctt ggg gat gcg ttg ctg gtt cac cct gta tca gac	391
Asp Gln Tyr Leu Leu Gly Asp Ala Leu Leu Val His Pro Val Ser Asp	
105 110 115	
tct gga gcc cat ggt gtc cag gtc tat ctg cct ggc caa ggg gag gtg	439
Ser Gly Ala His Gly Val Gln Val Tyr Leu Pro Gly Gln Gly Glu Val	
120 125 130	
tgg tat gac att caa agc tac cag aag cat cat ggt ccc cag acc ctg	487
Trp Tyr Asp Ile Gln Ser Tyr Gln Lys His His Gly Pro Gln Thr Leu	
135 140 145 150	
tac ctg cct gta act cta agc agt atc cct gtg ttc cag cgt gga ggg	535
Tyr Leu Pro Val Thr Leu Ser Ser Ile Pro Val Phe Gln Arg Gly Gly	
155 160 165	
aca atc gtg cct cga tgg atg cga gtg cgg cgg tct tca gaa tgt atg	583
Thr Ile Val Pro Arg Trp Met Arg Val Arg Arg Ser Ser Glu Cys Met	
170 175 180	
aag gat gac ccc atc act ctc ttt gtt gca ctt agc cct cag ggt aca	631
Lys Asp Asp Pro Ile Thr Leu Phe Val Ala Leu Ser Pro Gln Gly Thr	
185 190 195	
gct caa gga gag ctc ttt ctg gat gat ggg cac acg ttc aac tat cag	679
Ala Gln Gly Glu Leu Phe Leu Asp Asp Gly His Thr Phe Asn Tyr Gln	
200 205 210	
act cgc caa gag ttc ctg ctg cgt cga ttc tca ttc tct ggc aac acc	727
Thr Arg Gln Glu Phe Leu Leu Arg Arg Phe Ser Phe Ser Gly Asn Thr	
215 220 225 230	
ctt gtc tcc agc tca gca gac cct gaa gga cac ttt gag aca cca atc	775
Leu Val Ser Ser Ser Ala Asp Pro Glu Gly His Phe Glu Thr Pro Ile	
235 240 245	
tgg att gag cgg gtg gtg ata ata ggg gct gga aag cca gca gct gtg	823
Trp Ile Glu Arg Val Val Ile Ile Gly Ala Gly Lys Pro Ala Ala Val	
250 255 260	
gta ctc cag aca aaa gga tct cca gaa agc cgc ctg tcc ttc cag cat	871
Val Leu Gln Thr Lys Gly Ser Pro Glu Ser Arg Leu Ser Phe Gln His	

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265	270	275	
gac cct gag acc tct gtg ttg gtc ctg cgc aag cct ggc atc aat gtg			919
Asp Pro Glu Thr Ser Val Leu Val Leu Arg Lys Pro Gly Ile Asn Val			
280	285	290	
gca tct gat tgg agt att cac ctg cga taacccaagg gatgttctgg gtta			970
Ala Ser Asp Trp Ser Ile His Leu Arg			
295	300		
gggggagggg aggggagcat tagtgctgag agatattcct tcttctgcct tggagttcgg			1030
ccctccccag acttcaactta tgctagtcta agaccagat tctgccaaca tttgggcagg			1090
atgagagggc tgaccctggg ctccaaattc ctcttgtgat ctctcacct ctcccactcc			1150
attgatacca actctttccc ttcattcccc caacatcctg ttgctetaac tggagcacat			1210
tcaacttacga acaccaggaa accacagggc ccttgctgcc ccttctcttt cccttattta			1270
ggagccctga actccccag agtctatcca ttcattgctc ttgtatgttg atgccacttc			1330
ttggaagaag atgagggcaa tgagttaggg ctccctttcc ccttccctcc caccagattg			1390
ctctcccacc tttcatttct tctccaggc tttactcccc tttttatgcc ccaccgatac			1450
actgggacca ccccttacc cggacaggat gaatggatca aaggagtgag gttgctaaag			1510
aacatccttt tccctctcat tctacccttt tctctcccc gattccttgt agagctgctg			1570
caattcttag aggggcagtt ctacctctc tgtccctcgg cagaaagacg tttccacacc			1630
tcttagggga tgcgcattaa acttcttttg cccctctctt gtccctttg aggggcactt			1690
aagatggaga aatcagttgt ggtttcagtg aatcatggtc acctgtattt attgctagga			1750
gaagcctgag ggtgggggga gatgatcatg tgtgctcggg gttggctgga agccctgggt			1810
ggggggttg gggaggacta atggggagtc ggggaatatt tgtgggtatt ttttttactt			1870
cctcttggtt cccagctgtg acacgttttg atcaaaggag aaacaataaa gggataaacc			1930
at			1932

&lt;210&gt; 30

&lt;211&gt; 1124

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (73)...(555)

&lt;400&gt; 30

ggaagagccg tcaacttagc gaggcaaca ggcgcgcgt gaggagctgg agctgggtggg	60
gactgggcgc ca atg gac aag ctg aag aag gtg ctg agc ggg cag gac acg	111

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Met Asp Lys Leu Lys Lys Val Leu Ser Gly Gln Asp Thr									
1	5	10							
gag gac cgg agc ggc ctg tcc gag gtt gtt gag gca tct tca tta agc			159						
Glu Asp Arg Ser Gly Leu Ser Glu Val Val Glu Ala Ser Ser Leu Ser									
15	20	25							
tgg agt acc agg ata aaa ggc ttc att gcg tgt ttt gct ata gga att			207						
Trp Ser Thr Arg Ile Lys Gly Phe Ile Ala Cys Phe Ala Ile Gly Ile									
30	35	40	45						
ctc tgc tca ctg ctg ggt act gtt ctg ctg tgg gtg ccc agg aag gga			255						
Leu Cys Ser Leu Leu Gly Thr Val Leu Leu Trp Val Pro Arg Lys Gly									
50	55	60							
cta cac ctc ttc gca gtg ttt tat acc ttt ggt aat atc gca tca att			303						
Leu His Leu Phe Ala Val Phe Tyr Thr Phe Gly Asn Ile Ala Ser Ile									
65	70	75							
ggg agt acc atc ttc ctc atg gga cca gtg aaa cag ctg aag cga atg			351						
Gly Ser Thr Ile Phe Leu Met Gly Pro Val Lys Gln Leu Lys Arg Met									
80	85	90							
ttt gag cct act cgt ttg att gca act atc atg gtg ctg ttg tgt ttt			399						
Phe Glu Pro Thr Arg Leu Ile Ala Thr Ile Met Val Leu Leu Cys Phe									
95	100	105							
gca ctt acc ctg tgt tct gcc ttt tgg tgg cat aac aag gga ctt gca			447						
Ala Leu Thr Leu Cys Ser Ala Phe Trp Trp His Asn Lys Gly Leu Ala									
110	115	120	125						
ctt atc ttc tgc att ttg cag tct ttg gca ttg acg tgg tac agc ctt			495						
Leu Ile Phe Cys Ile Leu Gln Ser Leu Ala Leu Thr Trp Tyr Ser Leu									
130	135	140							
tcc ttc ata cca ttt gca agg gat gct gtg aag aag tgt ttt gcc gtg			543						
Ser Phe Ile Pro Phe Ala Arg Asp Ala Val Lys Lys Cys Phe Ala Val									
145	150	155							
tgt ctt gca taattcatgg ccagttttat gaagctttgg aaggcactat ggacagaa			600						
Cys Leu Ala									
160									
gctggtggac agttttgtaa ctatcttcga aacctctgtc ttacagacat gtgcctttta			660						
tcttgacgca atgtgttgct tgtgattcga acatttgagg gttacttttg gaagcaacaa			720						
tacattctcg aacctgaatg tcagtagcac aggatgagaa gtgggttctg tatcttgtgg			780						

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agtggaatct tcctcatgta cctgtttcct ctctggatgt tgtccactg aattcccatg      840
aatacaaaacc tattcagcaa cagcacataa gccttgggtg caagtgattc ccaggtggca      900
aaaggcagcc ccacagaga tcacgggagc aacagtaagg gacagagttt tgggggccac      960
ttgtccctca gcatggaagc catcaccgtg gtctgcata gagtgagtct acttctactc     1020
tggcatctga gaacaagtga ctctgcttta gacaagcccc tggagagcct ggccatggag     1080
tgaggtagaa aagaagcact ttttggtggt atatgctgtt tctg                        1124

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&lt;210&gt; 31

&lt;211&gt; 1445

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 31

```

Met Gln Gly Pro Pro Leu Leu Thr Ala Ala His Leu Leu Cys Val Cys
   1             5             10             15
Thr Ala Ala Leu Ala Val Ala Pro Gly Pro Arg Phe Leu Val Thr Ala
           20             25             30
Pro Gly Ile Ile Arg Pro Gly Gly Asn Val Thr Ile Gly Val Glu Leu
           35             40             45
Leu Glu His Cys Pro Ser Gln Val Thr Val Lys Ala Glu Leu Leu Lys
           50             55             60
Thr Ala Ser Asn Leu Thr Val Ser Val Leu Glu Ala Glu Gly Val Phe
           65             70             75             80
Glu Lys Gly Ser Phe Lys Thr Leu Thr Leu Pro Ser Leu Pro Leu Asn
           85             90             95
Ser Ala Asp Glu Ile Tyr Glu Leu Arg Val Thr Gly Arg Thr Gln Asp
          100             105             110
Glu Ile Leu Phe Ser Asn Ser Thr Arg Leu Ser Phe Glu Thr Lys Arg
          115             120             125
Ile Ser Val Phe Ile Gln Thr Asp Lys Ala Leu Tyr Lys Pro Lys Gln
          130             135             140
Glu Val Lys Phe Arg Ile Val Thr Leu Phe Ser Asp Phe Lys Pro Tyr
          145             150             155             160
Lys Thr Ser Leu Asn Ile Leu Ile Lys Asp Pro Lys Ser Asn Leu Ile
          165             170             175
Gln Gln Trp Leu Ser Gln Gln Ser Asp Leu Gly Val Ile Ser Lys Thr

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	180		185		190
Phe	Gln	Leu	Ser	Ser	His
Pro	Ile	Leu	Gly	Asp	Trp
Ser	Ile	Gln	Val		
195		200		205	
Gln	Val	Asn	Asp	Gln	Thr
Tyr	Tyr	Gln	Ser	Phe	Gln
Val	Ser	Glu	Tyr		
210		215		220	
Val	Leu	Pro	Lys	Phe	Glu
Val	Thr	Leu	Gln	Thr	Pro
Leu	Tyr	Cys	Ser		
225		230		235	240
Met	Asn	Ser	Lys	His	Leu
Asn	Gly	Thr	Ile	Thr	Ala
Lys	Tyr	Thr	Tyr		
245		250		255	
Gly	Lys	Pro	Val	Lys	Gly
Asp	Val	Thr	Leu	Thr	Phe
Leu	Pro	Leu	Ser		
260		265		270	
Phe	Trp	Gly	Lys	Lys	Lys
Asn	Ile	Thr	Lys	Thr	Phe
Lys	Ile	Asn	Gly		
275		280		285	
Ser	Ala	Asn	Phe	Ser	Phe
Asn	Asp	Glu	Glu	Met	Lys
Asn	Val	Met	Asp		
290		295		300	
Ser	Ser	Asn	Gly	Leu	Ser
Glu	Tyr	Leu	Asp	Leu	Ser
Phe	Pro	Gly	Pro		
305		310		315	320
Val	Glu	Ile	Leu	Thr	Thr
Val	Thr	Glu	Ser	Val	Thr
Gly	Ile	Ser	Arg		
325		330		335	
Asn	Val	Ser	Thr	Asn	Val
Phe	Phe	Lys	Gln	His	Asp
Tyr	Ile	Ile	Glu		
340		345		350	
Phe	Phe	Asp	Tyr	Thr	Thr
Val	Leu	Lys	Pro	Ser	Leu
Asn	Phe	Thr	Ala		
355		360		365	
Thr	Val	Lys	Val	Thr	Arg
Ala	Asp	Gly	Asn	Gln	Leu
Thr	Leu	Glu	Glu		
370		375		380	
Arg	Arg	Asn	Asn	Val	Val
Ile	Thr	Val	Thr	Gln	Arg
Asn	Tyr	Thr	Glu		
385		390		395	400
Tyr	Trp	Ser	Gly	Ser	Asn
Ser	Gly	Asn	Gln	Lys	Met
Glu	Ala	Val	Gln		
405		410		415	
Lys	Ile	Asn	Tyr	Thr	Val
Pro	Gln	Ser	Gly	Thr	Phe
Lys	Ile	Glu	Phe		
420		425		430	
Pro	Ile	Leu	Glu	Asp	Ser
Ser	Glu	Leu	Gln	Leu	Lys
Ala	Tyr	Phe	Leu		
435		440		445	
Gly	Ser	Lys	Ser	Ser	Met
Ala	Val	His	Ser	Leu	Phe
Lys	Ser	Pro	Ser		
450		455		460	

50/233

Lys Thr Tyr Ile Gln Leu Lys Thr Arg Asp Glu Asn Ile Lys Val Gly  
 465 470 475 480  
 Ser Pro Phe Glu Leu Val Val Ser Gly Asn Lys Arg Leu Lys Glu Leu  
 485 490 495  
 Ser Tyr Met Val Val Ser Arg Gly Gln Leu Val Ala Val Gly Lys Gln  
 500 505 510  
 Asn Ser Thr Met Phe Ser Leu Thr Pro Glu Asn Ser Trp Thr Pro Lys  
 515 520 525  
 Ala Cys Val Ile Val Tyr Tyr Ile Glu Asp Asp Gly Glu Ile Ile Ser  
 530 535 540  
 Asp Val Leu Lys Ile Pro Val Gln Leu Val Phe Lys Asn Lys Ile Lys  
 545 550 555 560  
 Leu Tyr Trp Ser Lys Val Lys Ala Glu Pro Ser Glu Lys Val Ser Leu  
 565 570 575  
 Arg Ile Ser Val Thr Gln Pro Asp Ser Ile Val Gly Ile Val Ala Val  
 580 585 590  
 Asp Lys Ser Val Asn Leu Met Asn Ala Ser Asn Asp Ile Thr Met Glu  
 595 600 605  
 Asn Val Val His Glu Leu Glu Leu Tyr Asn Thr Gly Tyr Tyr Leu Gly  
 610 615 620  
 Met Phe Met Asn Ser Phe Ala Val Phe Gln Glu Cys Gly Leu Trp Val  
 625 630 635 640  
 Leu Thr Asp Ala Asn Leu Thr Lys Asp Tyr Ile Asp Gly Val Tyr Asp  
 645 650 655  
 Asn Ala Glu Tyr Ala Glu Arg Phe Met Glu Glu Asn Glu Gly His Ile  
 660 665 670  
 Val Asp Ile His Asp Phe Ser Leu Gly Ser Ser Pro His Val Arg Lys  
 675 680 685  
 His Phe Pro Glu Thr Trp Ile Trp Leu Asp Thr Asn Met Gly Ser Arg  
 690 695 700  
 Ile Tyr Gln Glu Phe Glu Val Thr Val Pro Asp Ser Ile Thr Ser Trp  
 705 710 715 720  
 Val Ala Thr Gly Phe Val Ile Ser Glu Asp Leu Gly Leu Gly Leu Thr  
 725 730 735  
 Thr Thr Pro Val Glu Leu Gln Ala Phe Gln Pro Phe Phe Ile Phe Leu

51/233

740	745	750
Asn Leu Pro Tyr Ser Val Ile Arg Gly Glu Glu Phe Ala Leu Glu Ile		
755	760	765
Thr Ile Phe Asn Tyr Leu Lys Asp Ala Thr Glu Val Lys Val Ile Ile		
770	775	780
Glu Lys Ser Asp Lys Phe Asp Ile Leu Met Thr Ser Ser Glu Ile Asn		
785	790	795
Ala Thr Gly His Gln Gln Thr Leu Leu Val Pro Ser Glu Asp Gly Ala		
805	810	815
Thr Val Leu Phe Pro Ile Arg Pro Thr His Leu Gly Glu Ile Pro Ile		
820	825	830
Thr Val Thr Ala Leu Ser Pro Thr Ala Ser Asp Ala Ile Thr Gln Met		
835	840	845
Ile Leu Val Lys Ala Glu Gly Ile Glu Lys Ser Tyr Ser Gln Ser Ile		
850	855	860
Leu Leu Asp Leu Thr Asp Asn Arg Leu Gln Ser Thr Leu Lys Thr Leu		
865	870	875
Ser Phe Ser Phe Pro Pro Asn Thr Val Thr Gly Ser Glu Arg Val Gln		
885	890	895
Ile Thr Ala Ile Gly Asp Val Leu Gly Pro Ser Ile Asn Gly Leu Ala		
900	905	910
Ser Leu Ile Arg Met Pro Tyr Gly Cys Gly Glu Gln Asn Met Ile Asn		
915	920	925
Phe Ala Pro Asn Ile Tyr Ile Leu Asp Tyr Leu Thr Lys Lys Lys Gln		
930	935	940
Leu Thr Asp Asn Leu Lys Glu Lys Ala Leu Ser Phe Met Arg Gln Gly		
945	950	955
Tyr Gln Arg Glu Leu Leu Tyr Gln Arg Glu Asp Gly Ser Phe Ser Ala		
965	970	975
Phe Gly Asn Tyr Asp Pro Ser Gly Ser Thr Trp Leu Ser Ala Phe Val		
980	985	990
Leu Arg Cys Phe Leu Glu Ala Asp Pro Tyr Ile Asp Ile Asp Gln Asn		
995	1000	1005
Val Leu His Arg Thr Tyr Thr Trp Leu Lys Gly His Gln Lys Ser Asn		
1010	1015	1020



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Gly Glu Phe Trp Asp Pro Gly Arg Val Ile His Ser Glu Leu Gln Gly  
 1025                      1030                      1035                      1040  
 Gly Asn Lys Ser Pro Val Thr Leu Thr Ala Tyr Ile Val Thr Ser Leu  
                          1045                      1050                      1055  
 Leu Gly Tyr Arg Lys Tyr Gln Pro Asn Ile Asp Val Gln Glu Ser Ile  
                          1060                      1065                      1070  
 His Phe Leu Glu Ser Glu Phe Ser Arg Gly Ile Ser Asp Asn Tyr Thr  
                          1075                      1080                      1085  
 Leu Ala Leu Ile Thr Tyr Ala Leu Ser Ser Val Gly Ser Pro Lys Ala  
                          1090                      1095                      1100  
 Lys Glu Ala Leu Asn Met Leu Thr Trp Arg Ala Glu Gln Glu Gly Gly  
 1105                      1110                      1115                      1120  
 Met Gln Phe Trp Val Ser Ser Glu Ser Lys Leu Ser Asp Ser Trp Gln  
                          1125                      1130                      1135  
 Pro Arg Ser Leu Asp Ile Glu Val Ala Ala Tyr Ala Leu Leu Ser His  
                          1140                      1145                      1150  
 Phe Leu Gln Phe Gln Thr Ser Glu Gly Ile Pro Ile Met Arg Trp Leu  
                          1155                      1160                      1165  
 Ser Arg Gln Arg Asn Ser Leu Gly Gly Phe Ala Ser Thr Gln Asp Thr  
                          1170                      1175                      1180  
 Thr Val Ala Leu Lys Ala Leu Ser Glu Phe Ala Ala Leu Met Asn Thr  
 1185                      1190                      1195                      1200  
 Glu Arg Thr Asn Ile Gln Val Thr Val Thr Gly Pro Ser Ser Pro Ser  
                          1205                      1210                      1215  
 Pro Val Lys Phe Leu Ile Asp Thr His Asn Arg Leu Leu Leu Gln Thr  
                          1220                      1225                      1230  
 Ala Glu Leu Ala Val Val Gln Pro Thr Ala Val Asn Ile Ser Ala Asn  
                          1235                      1240                      1245  
 Gly Phe Gly Phe Ala Ile Cys Gln Leu Asn Val Val Tyr Asn Val Lys  
                          1250                      1255                      1260  
 Ala Ser Gly Ser Ser Arg Arg Arg Arg Ser Ile Gln Asn Gln Glu Ala  
 1265                      1270                      1275                      1280  
 Phe Asp Leu Asp Val Ala Val Lys Glu Asn Lys Asp Asp Leu Asn His  
                          1285                      1290                      1295  
 Val Asp Leu Asn Val Cys Thr Ser Phe Ser Gly Pro Gly Arg Ser Gly

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1300	1305	1310
Met Ala Leu Met Glu Val Asn Leu Leu Ser Gly Phe Met Val Pro Ser		
1315	1320	1325
Glu Ala Ile Ser Leu Ser Glu Thr Val Lys Lys Val Glu Tyr Asp His		
1330	1335	1340
Gly Lys Leu Asn Leu Tyr Leu Asp Ser Val Asn Glu Thr Gln Phe Cys		
1345	1350	1355
Val Asn Ile Pro Ala Val Arg Asn Phe Lys Val Ser Asn Thr Gln Asp		
1365	1370	1375
Ala Ser Val Ser Ile Val Asp Tyr Tyr Glu Pro Arg Arg Gln Ala Val		
1380	1385	1390
Arg Ser Tyr Asn Ser Glu Val Lys Leu Ser Ser Cys Asp Leu Cys Ser		
1395	1400	1405
Asp Val Gln Gly Cys Arg Pro Cys Glu Asp Gly Ala Ser Gly Ser His		
1410	1415	1420
His His Ser Ser Val Ile Phe Ile Phe Cys Phe Lys Leu Leu Tyr Phe		
1425	1430	1435
Met Glu Leu Trp Leu		
1445		

&lt;210&gt; 32

&lt;211&gt; 582

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 32

Met Phe Pro Ala Gly Pro Pro Ser His Ser Leu Leu Arg Leu Pro Leu
1 5 10 15
Leu Gln Leu Leu Leu Leu Val Val Gln Ala Val Gly Arg Gly Leu Gly
20 25 30
Arg Ala Ser Pro Ala Gly Gly Pro Leu Glu Asp Val Val Ile Glu Arg
35 40 45
Tyr His Ile Pro Arg Ala Cys Pro Arg Glu Val Gln Met Gly Asp Phe
50 55 60
Val Arg Tyr His Tyr Asn Gly Thr Phe Glu Asp Gly Lys Lys Phe Asp
65 70 75 80

54/233

Ser Ser Tyr Asp Arg Asn Thr Leu Val Ala Ile Val Val Gly Val Gly  
                             85                            90                            95  
 Arg Leu Ile Thr Gly Met Asp Arg Gly Leu Met Gly Met Cys Val Asn  
                             100                            105                            110  
 Glu Arg Arg Arg Leu Ile Val Pro Pro His Leu Gly Tyr Gly Ser Ile  
                             115                            120                            125  
 Gly Leu Ala Gly Leu Ile Pro Pro Asp Ala Thr Leu Tyr Phe Asp Val  
                             130                            135                            140  
 Val Leu Leu Asp Val Trp Asn Lys Glu Asp Thr Val Gln Val Ser Thr  
                             145                            150                            155                            160  
 Leu Leu Arg Pro Pro His Cys Pro Arg Met Val Gln Asp Gly Asp Phe  
                             165                            170                            175  
 Val Arg Tyr His Tyr Asn Gly Thr Leu Leu Asp Gly Thr Ser Phe Asp  
                             180                            185                            190  
 Thr Ser Tyr Ser Lys Gly Gly Thr Tyr Asp Thr Tyr Val Gly Ser Gly  
                             195                            200                            205  
 Trp Leu Ile Lys Gly Met Asp Gln Gly Leu Leu Gly Met Cys Pro Gly  
                             210                            215                            220  
 Glu Arg Arg Lys Ile Ile Ile Pro Pro Phe Leu Ala Tyr Gly Glu Lys  
                             225                            230                            235                            240  
 Gly Tyr Gly Thr Val Ile Pro Pro Gln Ala Ser Leu Val Phe His Val  
                             245                            250                            255  
 Leu Leu Ile Asp Val His Asn Pro Lys Asp Ala Val Gln Leu Glu Thr  
                             260                            265                            270  
 Leu Glu Leu Pro Pro Gly Cys Val Arg Arg Ala Gly Ala Gly Asp Phe  
                             275                            280                            285  
 Met Arg Tyr His Tyr Asn Gly Ser Leu Met Asp Gly Thr Leu Phe Asp  
                             290                            295                            300  
 Ser Ser Tyr Ser Arg Asn His Thr Tyr Asn Thr Tyr Ile Gly Gln Gly  
                             305                            310                            315                            320  
 Tyr Ile Ile Pro Gly Met Asp Gln Gly Leu Gln Gly Ala Cys Met Gly  
                             325                            330                            335  
 Glu Arg Arg Arg Ile Thr Ile Pro Pro His Leu Ala Tyr Gly Glu Asn  
                             340                            345                            350  
 Gly Thr Gly Asp Lys Ile Pro Gly Ser Ala Val Leu Ile Phe Asn Val

55/233

355	360	365
His Val Ile Asp Phe	His Asn Pro Ala Asp Val	Val Glu Ile Arg Thr
370	375	380
Leu Ser Arg Pro Ser	Glu Thr Cys Asn Glu Thr	Thr Lys Leu Gly Asp
385	390	395
Phe Val Arg Tyr His	Tyr Asn Cys Ser Leu Leu	Asp Gly Thr Gln Leu
405	410	415
Phe Thr Ser His Asp	Tyr Gly Ala Pro Gln Glu Ala	Thr Leu Gly Ala
420	425	430
Asn Lys Val Ile Glu	Gly Leu Asp Thr Gly Leu	Gln Gly Met Cys Val
435	440	445
Gly Glu Arg Arg Gln	Leu Ile Val Pro Pro His	Leu Ala His Gly Glu
450	455	460
Ser Gly Ala Arg Gly	Val Pro Gly Ser Ala Val	Leu Leu Phe Glu Val
465	470	475
Glu Leu Val Ser Arg	Glu Asp Gly Leu Pro Thr	Gly Tyr Leu Phe Val
485	490	495
Trp His Lys Asp Pro	Pro Ala Asn Leu Phe Glu	Asp Met Asp Leu Asn
500	505	510
Lys Asp Gly Glu Val	Pro Pro Glu Glu Phe Ser	Thr Phe Ile Lys Ala
515	520	525
Gln Val Ser Glu Gly	Lys Gly Arg Leu Met Pro	Gly Gln Asp Pro Glu
530	535	540
Lys Thr Ile Gly Asp	Met Phe Gln Asn Gln Asp	Arg Asn Gln Asp Gly
545	550	555
Lys Ile Thr Val Asp	Glu Leu Lys Leu Lys Ser	Asp Glu Asp Glu Glu
565	570	575
Arg Val His Glu Glu	Leu	
580		

&lt;210&gt; 33

&lt;211&gt; 410

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 33

56/233

Met Glu Leu Pro Ser Gly Pro Gly Pro Glu Arg Leu Phe Asp Ser His  
 1 5 10 15  
 Arg Leu Pro Gly Asp Cys Phe Leu Leu Leu Val Leu Leu Leu Tyr Ala  
 20 25 30  
 Pro Val Gly Phe Cys Leu Leu Val Leu Arg Leu Phe Leu Gly Ile His  
 35 40 45  
 Val Phe Leu Val Ser Cys Ala Leu Pro Asp Ser Val Leu Arg Arg Phe  
 50 55 60  
 Val Val Arg Thr Met Cys Ala Val Leu Gly Leu Val Ala Arg Gln Glu  
 65 70 75 80  
 Asp Ser Gly Leu Arg Asp His Ser Val Arg Val Leu Ile Ser Asn His  
 85 90 95  
 Val Thr Pro Phe Asp His Asn Ile Val Asn Leu Leu Thr Thr Cys Ser  
 100 105 110  
 Thr Pro Leu Leu Asn Ser Pro Pro Ser Phe Val Cys Trp Ser Arg Gly  
 115 120 125  
 Phe Met Glu Met Asn Gly Arg Gly Glu Leu Val Glu Ser Leu Lys Arg  
 130 135 140  
 Phe Cys Ala Ser Thr Arg Leu Pro Pro Thr Pro Leu Leu Leu Phe Pro  
 145 150 155 160  
 Glu Glu Glu Ala Thr Asn Gly Arg Glu Gly Leu Leu Arg Phe Ser Ser  
 165 170 175  
 Trp Pro Phe Ser Ile Gln Asp Val Val Gln Pro Leu Thr Leu Gln Val  
 180 185 190  
 Gln Arg Pro Leu Val Ser Val Thr Val Ser Asp Ala Ser Trp Val Ser  
 195 200 205  
 Glu Leu Leu Trp Ser Leu Phe Val Pro Phe Thr Val Tyr Gln Val Arg  
 210 215 220  
 Trp Leu Arg Pro Val His Arg Gln Leu Gly Glu Ala Asn Glu Glu Phe  
 225 230 235 240  
 Ala Leu Arg Val Gln Gln Leu Val Ala Lys Glu Leu Gly Gln Thr Gly  
 245 250 255  
 Thr Arg Leu Thr Pro Ala Asp Lys Ala Glu His Met Lys Arg Gln Arg  
 260 265 270  
 His Pro Arg Leu Arg Pro Gln Ser Ala Gln Ser Ser Phe Pro Pro Ser

57/233

275	280	285
Pro Gly Pro Ser Pro Asp Val Gln Leu Ala Thr Leu Ala Gln Arg Val		
290	295	300
Lys Glu Val Leu Pro His Val Pro Leu Gly Val Ile Gln Arg Asp Leu		
305	310	315
Ala Lys Thr Gly Cys Val Asp Leu Thr Ile Thr Asn Leu Leu Glu Gly		
325	330	335
Ala Val Ala Phe Met Pro Glu Asp Ile Thr Lys Gly Thr Gln Ser Leu		
340	345	350
Pro Thr Ala Ser Ala Ser Lys Phe Pro Ser Ser Gly Pro Val Thr Pro		
355	360	365
Gln Pro Thr Ala Leu Thr Phe Ala Lys Ser Ser Trp Ala Arg Gln Glu		
370	375	380
Ser Leu Gln Glu Arg Lys Gln Ala Leu Tyr Glu Tyr Ala Arg Arg Arg		
385	390	395
Phe Thr Glu Arg Arg Ala Gln Glu Ala Asp		
405	410	

&lt;210&gt; 34

&lt;211&gt; 483

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 34

Met Glu Glu Gly Gly Gly Gly Val Arg Ser Leu Val Pro Gly Gly Pro		
1	5	10
Val Leu Leu Val Leu Cys Gly Leu Leu Glu Ala Ser Gly Gly Gly Arg		
20	25	30
Ala Leu Pro Gln Leu Ser Asp Asp Ile Pro Phe Arg Val Asn Trp Pro		
35	40	45
Gly Thr Glu Phe Ser Leu Pro Thr Thr Gly Val Leu Tyr Lys Glu Asp		
50	55	60
Asn Tyr Val Ile Met Thr Thr Ala His Lys Glu Lys Tyr Lys Cys Ile		
65	70	75
Leu Pro Leu Val Thr Ser Gly Asp Glu Glu Glu Glu Lys Asp Tyr Lys		
85	90	95

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Gly Pro Asn Pro Arg Glu Leu Leu Glu Pro Leu Phe Lys Gln Ser Ser  
 100 105 110  
 Cys Ser Tyr Arg Ile Glu Ser Tyr Trp Thr Tyr Glu Val Cys His Gly  
 115 120 125  
 Lys His Ile Arg Gln Tyr His Glu Glu Lys Glu Thr Gly Gln Lys Ile  
 130 135 140  
 Asn Ile His Glu Tyr Tyr Leu Gly Asn Met Leu Ala Lys Asn Leu Leu  
 145 150 155 160  
 Phe Glu Lys Glu Arg Glu Ala Glu Glu Lys Glu Lys Ser Asn Glu Ile  
 165 170 175  
 Pro Thr Lys Asn Ile Glu Gly Gln Met Thr Pro Tyr Tyr Pro Val Gly  
 180 185 190  
 Met Gly Asn Gly Thr Pro Cys Ser Leu Lys Gln Asn Arg Pro Arg Ser  
 195 200 205  
 Ser Thr Val Met Tyr Ile Cys His Pro Glu Ser Lys His Glu Ile Leu  
 210 215 220  
 Ser Val Ala Glu Val Thr Thr Cys Glu Tyr Glu Val Val Ile Leu Thr  
 225 230 235 240  
 Pro Leu Leu Cys Ser His Pro Lys Tyr Arg Phe Arg Ala Ser Pro Val  
 245 250 255  
 Asn Asp Ile Phe Cys Gln Ser Leu Pro Gly Ser Pro Phe Lys Pro Leu  
 260 265 270  
 Thr Leu Arg Gln Leu Glu Gln Gln Glu Glu Ile Leu Arg Val Pro Phe  
 275 280 285  
 Arg Arg Asn Lys Glu Glu Asp Leu Gln Ser Thr Lys Glu Glu Arg Phe  
 290 295 300  
 Pro Ala Ile His Lys Ser Ile Ala Ile Gly Ser Gln Pro Val Leu Thr  
 305 310 315 320  
 Val Gly Thr Thr His Ile Ser Lys Leu Thr Asp Asp Gln Leu Ile Lys  
 325 330 335  
 Glu Phe Leu Ser Gly Ser Tyr Cys Phe Arg Gly Gly Val Gly Trp Trp  
 340 345 350  
 Lys Tyr Glu Phe Cys Tyr Gly Lys His Val His Gln Tyr His Glu Asp  
 355 360 365  
 Lys Asp Ser Gly Lys Thr Ser Val Val Val Gly Thr Trp Asn Gln Glu

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      370              375              380
Glu His Ile Glu Trp Ala Lys Lys Asn Thr Ala Arg Ala Tyr His Leu
385              390              395              400
Gln Asp Asp Gly Thr Gln Thr Val Arg Met Val Ser His Phe Tyr Gly
      405              410              415
Asn Gly Asp Ile Cys Asp Ile Thr Asp Lys Pro Arg Gln Val Thr Val
      420              425              430
Lys Leu Lys Cys Lys Glu Ser Asp Ser Pro His Ala Val Thr Val Tyr
      435              440              445
Met Leu Glu Pro His Ser Cys Gln Tyr Ile Leu Gly Val Glu Ser Pro
      450              455              460
Val Ile Cys Lys Ile Leu Asp Thr Ala Asp Glu Asn Gly Leu Leu Ser
465              470              475              480
Leu Pro Asn

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&lt;210&gt; 35

&lt;211&gt; 607

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 35

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Met Gly Phe Glu Glu Leu Leu Glu Gln Val Gly Gly Phe Gly Pro Phe
  1              5              10              15
Gln Leu Arg Asn Val Ala Leu Leu Ala Leu Pro Arg Val Leu Leu Pro
      20              25              30
Leu His Phe Leu Leu Pro Ile Phe Leu Ala Ala Val Pro Ala His Arg
      35              40              45
Cys Ala Leu Pro Gly Ala Pro Ala Asn Phe Ser His Gln Asp Val Trp
      50              55              60
Leu Glu Ala His Leu Pro Arg Glu Pro Asp Gly Thr Leu Ser Ser Cys
      65              70              75              80
Leu Arg Phe Ala Tyr Pro Gln Ala Leu Pro Asn Thr Thr Leu Gly Glu
      85              90              95
Glu Arg Gln Ser Arg Gly Glu Leu Glu Asp Glu Pro Ala Thr Val Pro
      100              105              110

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60/233

Cys Ser Gln Gly Trp Glu Tyr Asp His Ser Glu Phe Ser Ser Thr Ile  
 115 120 125  
 Ala Thr Glu Ser Gln Val Gly Ile Tyr Ile Ile His Leu Glu Val Glu  
 130 135 140  
 Cys Arg Trp Arg Gln Ser Pro Trp Glu Ala Ala Gly Arg Gly Leu Pro  
 145 150 155 160  
 Trp Glu Glu Ala Glu Ala Ala Gly Leu Gly Arg Asp Lys Val Ser Tyr  
 165 170 175  
 Ser Pro Ser Trp Arg Glu Ser Leu Gly Gly Leu Leu Ser Gly Met Glu  
 180 185 190  
 Trp Asp Leu Val Cys Glu Gln Lys Gly Leu Asn Arg Ala Ala Ser Thr  
 195 200 205  
 Phe Phe Phe Ala Gly Val Leu Val Gly Ala Val Ala Phe Gly Tyr Leu  
 210 215 220  
 Ser Asp Arg Phe Gly Arg Arg Arg Leu Leu Leu Val Ala Tyr Val Ser  
 225 230 235 240  
 Thr Leu Val Leu Gly Leu Ala Ser Ala Ala Ser Val Ser Tyr Val Met  
 245 250 255  
 Phe Ala Ile Thr Arg Thr Leu Thr Gly Ser Ala Leu Ala Gly Phe Thr  
 260 265 270  
 Ile Ile Val Met Pro Leu Glu Leu Glu Trp Leu Asp Val Glu His Arg  
 275 280 285  
 Thr Val Ala Gly Val Leu Ser Ser Thr Phe Trp Thr Gly Gly Val Met  
 290 295 300  
 Leu Leu Ala Leu Val Gly Tyr Leu Ile Arg Asp Trp Arg Trp Leu Leu  
 305 310 315 320  
 Leu Ala Val Thr Leu Pro Cys Ala Pro Gly Ile Leu Ser Leu Trp Trp  
 325 330 335  
 Val Pro Glu Ser Ala Arg Trp Leu Leu Thr Gln Gly His Val Lys Glu  
 340 345 350  
 Ala His Arg Tyr Leu Leu His Cys Ala Arg Leu Asn Gly Arg Pro Val  
 355 360 365  
 Cys Glu Asp Ser Phe Ser Gln Glu Ala Val Ser Lys Val Ala Ala Gly  
 370 375 380  
 Glu Arg Val Val Arg Arg Pro Ser Tyr Leu Asp Leu Phe Arg Thr Pro

61/233

385                      390                      395                      400  
 Arg Leu Arg His Ile Ser Leu Cys Cys Val Val Val Trp Phe Gly Val  
                          405                      410                      415  
 Asn Phe Ser Tyr Tyr Gly Leu Ser Leu Asp Val Ser Gly Leu Gly Leu  
                          420                      425                      430  
 Asn Val Tyr Gln Thr Gln Leu Leu Phe Gly Ala Val Glu Leu Pro Ser  
                          435                      440                      445  
 Lys Leu Leu Val Tyr Leu Ser Val Arg Tyr Ala Gly Arg Arg Leu Thr  
                          450                      455                      460  
 Gln Ala Gly Thr Leu Leu Gly Thr Ala Leu Ala Phe Gly Thr Arg Leu  
 465                      470                      475                      480  
 Leu Val Ser Ser Asp Met Lys Ser Trp Ser Thr Val Leu Ala Val Met  
                          485                      490                      495  
 Gly Lys Ala Phe Ser Glu Ala Ala Phe Thr Thr Ala Tyr Leu Phe Thr  
                          500                      505                      510  
 Ser Glu Leu Tyr Pro Thr Val Leu Arg Gln Thr Gly Met Gly Leu Thr  
                          515                      520                      525  
 Ala Leu Val Gly Arg Leu Gly Gly Ser Leu Ala Pro Leu Ala Ala Leu  
                          530                      535                      540  
 Leu Asp Gly Val Trp Leu Ser Leu Pro Lys Leu Thr Tyr Gly Gly Ile  
 545                      550                      555                      560  
 Ala Leu Leu Ala Ala Gly Thr Ala Leu Leu Leu Pro Glu Thr Arg Gln  
                          565                      570                      575  
 Ala Gln Leu Pro Glu Thr Ile Gln Asp Val Glu Arg Lys Ser Ala Pro  
                          580                      585                      590  
 Thr Ser Leu Gln Glu Glu Glu Met Pro Met Lys Gln Val Gln Asn  
                          595                      600                      605

&lt;210&gt; 36

&lt;211&gt; 314

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 36

Met Gly Ala Arg Gly Ala Leu Leu Leu Ala Leu Leu Leu Ala Arg Ala

1

5

10

15

62/233

Gly Leu Arg Lys Pro Glu Ser Gln Glu Ala Ala Pro Leu Ser Gly Pro  
 20 25 30  
 Cys Gly Arg Arg Val Ile Thr Ser Arg Ile Val Gly Gly Glu Asp Ala  
 35 40 45  
 Glu Leu Gly Arg Trp Pro Trp Gln Gly Ser Leu Arg Leu Trp Asp Ser  
 50 55 60  
 His Val Cys Gly Val Ser Leu Leu Ser His Arg Trp Ala Leu Thr Ala  
 65 70 75 80  
 Ala His Cys Phe Glu Thr Tyr Ser Asp Leu Ser Asp Pro Ser Gly Trp  
 85 90 95  
 Met Val Gln Phe Gly Gln Leu Thr Ser Met Pro Ser Phe Trp Ser Leu  
 100 105 110  
 Gln Ala Tyr Tyr Thr Arg Tyr Phe Val Ser Asn Ile Tyr Leu Ser Pro  
 115 120 125  
 Arg Tyr Leu Gly Asn Ser Pro Tyr Asp Ile Ala Leu Val Lys Leu Ser  
 130 135 140  
 Ala Pro Val Thr Tyr Thr Lys His Ile Gln Pro Ile Cys Leu Gln Ala  
 145 150 155 160  
 Ser Thr Phe Glu Phe Glu Asn Arg Thr Asp Cys Trp Val Thr Gly Trp  
 165 170 175  
 Gly Tyr Ile Lys Glu Asp Glu Ala Leu Pro Ser Pro His Thr Leu Gln  
 180 185 190  
 Glu Val Gln Val Ala Ile Ile Asn Asn Ser Met Cys Asn His Leu Phe  
 195 200 205  
 Leu Lys Tyr Ser Phe Arg Lys Asp Ile Phe Gly Asp Met Val Cys Ala  
 210 215 220  
 Gly Asn Ala Gln Gly Gly Lys Asp Ala Cys Phe Gly Asp Ser Gly Gly  
 225 230 235 240  
 Pro Leu Ala Cys Asn Lys Asn Gly Leu Trp Tyr Gln Ile Gly Val Val  
 245 250 255  
 Ser Trp Gly Val Gly Cys Gly Arg Pro Asn Arg Pro Gly Val Tyr Thr  
 260 265 270  
 Asn Ile Ser His His Phe Glu Trp Ile Gln Lys Leu Met Ala Gln Ser  
 275 280 285  
 Gly Met Ser Gln Pro Asp Pro Ser Trp Pro Leu Leu Phe Phe Pro Leu

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290                      295                      300  
 Leu Trp Ala Leu Pro Leu Leu Gly Pro Val  
 305                      310  
  
 <210> 37  
 <211> 94  
 <212> PRT  
 <213> Homo sapiens  
 <400> 37  
 Met Glu Leu Ser Asp Val Thr Leu Ile Glu Gly Val Gly Asn Glu Val  
       1                      5                      10                      15  
 Met Val Val Ala Gly Val Val Val Leu Ile Leu Ala Leu Val Leu Ala  
                          20                      25                      30  
 Trp Leu Ser Thr Tyr Val Ala Asp Ser Gly Ser Asn Gln Leu Leu Gly  
                          35                      40                      45  
 Ala Ile Val Ser Ala Gly Asp Thr Ser Val Leu His Leu Gly His Val  
                          50                      55                      60  
 Asp His Leu Val Ala Gly Gln Gly Asn Pro Glu Pro Thr Glu Leu Pro  
                          65                      70                      75                      80  
 His Pro Ser Glu Ala Asn Thr Ser Leu Asp Lys Lys Ala Arg  
    85                      90

<210> 38  
 <211> 218  
 <212> PRT  
 <213> Homo sapiens  
 <400> 38  
 Met Ala Ser Lys Ile Gly Ser Arg Arg Trp Met Leu Gln Leu Ile Met  
       1                      5                      10                      15  
 Gln Leu Gly Ser Val Leu Leu Thr Arg Cys Pro Phe Trp Gly Cys Phe  
                          20                      25                      30  
 Ser Gln Leu Met Leu Tyr Ala Glu Arg Ala Glu Ala Arg Arg Lys Pro  
                          35                      40                      45  
 Asp Ile Pro Val Pro Tyr Leu Tyr Phe Asp Met Gly Ala Ala Val Leu  
                          50                      55                      60

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Cys Ala Ser Phe Met Ser Phe Gly Val Lys Arg Arg Trp Phe Ala Leu  
 65 70 75 80  
 Gly Ala Ala Leu Gln Leu Ala Ile Ser Thr Tyr Ala Ala Tyr Ile Gly  
 85 90 95  
 Gly Tyr Val His Tyr Gly Asp Trp Leu Lys Val Arg Met Tyr Ser Arg  
 100 105 110  
 Thr Val Ala Ile Ile Gly Gly Leu Ser Cys Val Gly Gln Arg Cys Trp  
 115 120 125  
 Gly Ala Val Pro Pro Glu Thr Ser Gln Pro Leu Pro Ala Val His Arg  
 130 135 140  
 Pro Gly Val Pro Gly Tyr Leu Pro His Leu Cys Gly Leu Leu Thr Ala  
 145 150 155 160  
 Ala Gln Gln Gly Gly Pro Ala Gly Val Ser Glu Pro Ser Pro Arg Arg  
 165 170 175  
 Gly Ala Asp Asp Pro Ala Val Leu Arg Ala Val Trp His Pro Gly Pro  
 180 185 190  
 Gly Leu Ser Val Arg Leu Leu Arg Asp Pro Arg Cys Pro Asp Pro Gly  
 195 200 205  
 Cys Thr Ala Ala Pro Cys His Ala Ala His  
 210 215

&lt;210&gt; 39

&lt;211&gt; 460

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 39

Met Phe Thr Ile Lys Leu Leu Leu Phe Ile Val Pro Leu Val Ile Ser  
 1 5 10 15  
 Ser Arg Ile Asp Gln Asp Asn Ser Ser Phe Asp Ser Leu Ser Pro Glu  
 20 25 30  
 Pro Lys Ser Arg Phe Ala Met Leu Asp Asp Val Lys Ile Leu Ala Asn  
 35 40 45  
 Gly Leu Leu Gln Leu Gly His Gly Leu Lys Asp Phe Val His Lys Thr  
 50 55 60  
 Lys Gly Gln Ile Asn Asp Ile Phe Gln Lys Leu Asn Ile Phe Asp Gln

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65	70	75	80
Ser Phe Tyr Asp Leu Ser Leu Gln Thr Ser Glu Ile Lys Glu Glu Glu			
	85	90	95
Lys Glu Leu Arg Arg Thr Thr Tyr Lys Leu Gln Val Lys Asn Glu Glu			
	100	105	110
Val Lys Asn Met Ser Leu Glu Leu Asn Ser Lys Leu Glu Ser Leu Leu			
	115	120	125
Glu Glu Lys Ile Leu Leu Gln Gln Lys Val Lys Tyr Leu Glu Glu Gln			
	130	135	140
Leu Thr Asn Leu Ile Gln Asn Gln Pro Glu Thr Pro Glu His Pro Glu			
145	150	155	160
Val Thr Ser Leu Lys Thr Phe Val Glu Lys Gln Asp Asn Ser Ile Lys			
	165	170	175
Asp Leu Leu Gln Thr Val Glu Asp Gln Tyr Lys Gln Leu Asn Gln Gln			
	180	185	190
His Ser Gln Ile Lys Glu Ile Glu Asn Gln Leu Arg Arg Thr Ser Ile			
	195	200	205
Gln Glu Pro Thr Glu Ile Ser Leu Ser Ser Lys Pro Arg Ala Pro Arg			
	210	215	220
Thr Thr Pro Phe Leu Gln Leu Asn Glu Ile Arg Asn Val Lys His Asp			
225	230	235	240
Gly Ile Pro Ala Glu Cys Thr Thr Ile Tyr Asn Arg Gly Glu His Thr			
	245	250	255
Ser Gly Met Tyr Ala Ile Arg Pro Ser Asn Ser Gln Val Phe His Val			
	260	265	270
Tyr Cys Asp Val Ile Ser Gly Ser Pro Trp Thr Leu Ile Gln His Arg			
	275	280	285
Ile Asp Gly Ser Gln Asn Phe Asn Glu Thr Trp Glu Asn Tyr Lys Tyr			
	290	295	300
Gly Phe Gly Arg Leu Asp Gly Glu Phe Trp Leu Gly Leu Glu Lys Ile			
305	310	315	320
Tyr Ser Ile Val Lys Gln Ser Asn Tyr Val Leu Arg Ile Glu Leu Glu			
	325	330	335
Asp Trp Lys Asp Asn Lys His Tyr Ile Glu Tyr Ser Phe Tyr Leu Gly			
	340	345	350

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Asn His Glu Thr Asn Tyr Thr Leu His Leu Val Ala Ile Thr Gly Asn  
 355 360 365  
 Val Pro Asn Ala Ile Pro Glu Asn Lys Asp Leu Val Phe Ser Thr Trp  
 370 375 380  
 Asp His Lys Ala Lys Gly His Phe Asn Cys Pro Glu Gly Tyr Ser Gly  
 385 390 395 400  
 Gly Trp Trp Trp His Asp Glu Cys Gly Glu Asn Asn Leu Asn Gly Lys  
 405 410 415  
 Tyr Asn Lys Pro Arg Ala Lys Ser Lys Pro Glu Arg Arg Arg Gly Leu  
 420 425 430  
 Ser Trp Lys Ser Gln Asn Gly Arg Leu Tyr Ser Ile Lys Ser Thr Lys  
 435 440 445  
 Met Leu Ile His Pro Thr Asp Ser Glu Ser Phe Glu  
 450 455 460

&lt;210&gt; 40

&lt;211&gt; 216

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 40

Met Val Pro Met His Leu Leu Gly Arg Leu Glu Lys Pro Leu Leu Leu  
 1 5 10 15  
 Leu Cys Cys Ala Ser Phe Leu Leu Gly Leu Ala Leu Leu Gly Ile Lys  
 20 25 30  
 Thr Asp Ile Thr Pro Val Ala Tyr Phe Phe Leu Thr Leu Gly Gly Phe  
 35 40 45  
 Phe Leu Phe Ala Tyr Leu Leu Val Arg Phe Leu Glu Trp Gly Leu Arg  
 50 55 60  
 Ser Gln Leu Gln Ser Met Gln Thr Glu Ser Pro Gly Pro Ser Gly Asn  
 65 70 75 80  
 Ala Arg Asp Asn Glu Ala Phe Glu Val Pro Val Tyr Glu Glu Ala Val  
 85 90 95  
 Val Gly Leu Glu Ser Gln Cys Arg Pro Gln Glu Leu Asp Gln Pro Pro  
 100 105 110  
 Pro Tyr Ser Thr Val Val Ile Pro Pro Ala Pro Glu Glu Glu Gln Pro

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115	120	125
Ser His Pro Glu Gly Ser Arg Arg Ala Lys Leu Glu Gln Arg Arg Met		
130	135	140
Ala Ser Glu Gly Ser Met Ala Gln Glu Gly Ser Pro Gly Arg Ala Pro		
145	150	155
Ile Asn Leu Arg Leu Arg Gly Pro Arg Ala Val Ser Thr Ala Pro Asp		
165	170	175
Leu Gln Ser Leu Ala Ala Val Pro Thr Leu Glu Pro Leu Thr Pro Pro		
180	185	190
Pro Ala Tyr Asp Val Cys Phe Gly His Pro Asp Asp Asp Ser Val Phe		
195	200	205
Tyr Glu Asp Asn Trp Ala Pro Pro		
210	215	

&lt;210&gt; 41

&lt;211&gt; 4335

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 41

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aatgtgacta ttgggggtgga gcttctggaa cactgccott cacagggtgac tgtgaaggcg	180
gagctgctca agacagcatc aaacctcact gtctctgtcc tggaagcaga aggagtcttt	240
gaaaaaggct cttttaagac acttactctt ccatcactac ctctgaacag tgcagatgag	300
atztatgagc tacgtgtaac cggacgtacc caggatgaga ttttattctc taatagtacc	360
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aaaacctctt taaacattct cattaaggac cccaaatcaa atttgatcca acagtgggtg	540
tcacaacaaa gtgatcttgg agtcatttcc aaaacttttc agctatcttc ccatccaata	600
cttggtgact ggtctattca agttcaagtg aatgaccaga catattatca atcatttcag	660
gtttcagaat atgtattacc aaaatttgaa gtgaactttgc agacaccatt atattgttct	720
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acaaaaacat ttaagataaa tggatctgca aactctctt ttaatgatga agagatgaaa	900
aatgtaatgg attcttcaaa tggactttct gaatacctgg atctatcttt ccttgacca	960



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&lt;210&gt; 42

&lt;211&gt; 1746

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 42

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gagctc						1746

&lt;210&gt; 43

&lt;211&gt; 1230

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 43

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gactccggac	tccgggatca	cagtgtcagg	gtcctcattt	ccaaccatgt	gacaccttcc	300
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gtgtcagatg cctcctgggt ctccagaactg ctgtggtcac tttctgtccc tttcacggtg 660
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&lt;210&gt; 44

&lt;211&gt; 1449

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 44

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caagacgatg gtaccagagc agtcaggatg gtgtcacatt tttatggaaa tggagatatt	1260
tgtgatataa ctgacaaacc aagacagggtg actgtaaaac taaagtgcaa agaactcagat	1320
tcacctcatg ctgttactgt atatatgcta gagcctcact cctgtcaata tattcttggg	1380
gttgaatctc cagtgatctg taaaatotta gatacagcag atgaaaatgg acttctttct	1440
ctccccaac	1449

&lt;210&gt; 45

&lt;211&gt; 1821

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 45

atgggctttg aggagctgct ggagcagggtg ggcggctttg ggcccttcca actgcggaat	60
gtggcactgc tggccctgac ccgagtgctg ctaccactgc acttcctcct gccatcttc	120
ctggctgccc tgcctgcccc ccgatgtgac ctgcgggtg cccctgccc cttcagccat	180
caggatgtgt ggctggaggg ccatcttccc cgggagcctg atggcacgct cagctcctgc	240
ctccgctttg cctatcccca ggtcttccc aacaccacgt tgggggaaga aaggcagagc	300
cgtggggagc tggaggatga acctgccaca gtgccctgct ctccaggctg ggagtacgac	360
cactcagaat tctcctctac cattgcaact gagtcccagg tcggtattta cataatccat	420
ctggagggtg aatgtcgggt gaggcagctt cctggggag cagcaggctg aggccttctt	480
tgggaagaag ctgaggtgac aggaactggg agggacaaag tttcctattt cccaagctgg	540
cgtgaatcgt tgggaggttt attatctggc atggagtggt atctggtgtg tgagcagaaa	600
ggtctgaaca gagctgcgtc cactttcttc ttcccggtg tgcgtgtggg ggctgtggcc	660
tttgatatac tgtccgacag gtttgggcgg cggcgtctgc tgcgtgtgac ctacgtgagt	720
acctggtgac tgggcctggc atctgcagcc tccgtcagct atgtaatgtt tgccatcacc	780
cgcacctta ctggctcagc cctggctggg tttaccatca tcgtgatgcc actggagctg	840
gagtggctgg atgtggagca ccgcaccgtg gctggagtc tgagcagcac cttctggaca	900
gggggcgtga tgcgtctggc actggttggg tacctgatac gggactggcg atggcttctg	960
ctagctgtca cctgccttg tgccccagge atcctcagcc tctggtgggt gctgagctct	1020
gcacgtggc ttctgaccca aggccatgtg aaagaggccc acaggtactt gctccactgt	1080

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gccaggctca atgggcggcc agtgtgtgag gacagcttca gccaggagge tgtgagcaaa 1140
gtggccgccg gggaacgggt ggtccgaaga ccttcatacc tagacctgtt ccgcacacca 1200
cggctccgac acatctcact gtgctgcgtg gtggtgtggt tcggagtga cttctcctat 1260
tacggcctga gtctggatgt gtcggggctg gggctgaacg tgtaccagac acagctgttg 1320
ttcggggctg tggaactgcc ctccaagctg ctggtctact tgcgggtgcg ctacgcagga 1380
cgccgcctca cgcaagccgg gacactgctg ggcacggccc tggcgctcgg cactagactg 1440
ctagtgtcct ctgatatgaa gtcctggagc actgtcctgg cagtgatggg gaaagctttt 1500
tctgaagctg ccttcaccac tgcctacctg ttcacttcag agttgtaccc tacggtgctc 1560
agacagacag ggatggggct gactgcactg gtgggcccgc tggggggctc tttggcccca 1620
ctggcggcct tgctggatgg agtgtggctg tcaactgcca agcttactta tggggggatc 1680
gcctctgtgg ctgocggcac cgccctcctg ctgccagaga cgaggcaggc acagctgcca 1740
gagaccatcc aggacgtgga gagaaagagt gcccacacca gtcttcagga ggaagagatg 1800
cccatgaagc aggtccagaa c 1821

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&lt;210&gt; 46

&lt;211&gt; 942

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 46

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atggggcgcg gggggcgct gctgctggcg ctgctgctgg ctgggctgg actcaggaa 60
ccggagtcgc aggaggcggc gccgttatca ggaccatgcg gccgacgggt catcacgtcg 120
cgcatcgtgg gtggagagga cgccgaactc gggcgttggc cgtggcaggg gagcctgcgc 180
ctgtgggatt cccacgtatg cggagtgage ctgctcagcc accgctgggc actcacggcg 240
gcgcactgct ttgaaaccta tagtgacctt agtgatccct ccgggtggat ggtccagttt 300
ggccagctga cttccatgcc atccttctgg agcctgcagg cctactacac ccgttacttc 360
gtatcgaata tctatctgag ccctcgtctc ctggggaatt caccctatga cattgccttg 420
gtgaagctgt ctgcacctgt cacctacact aaacacatcc agcccatctg tctccaggcc 480
tccacatttg agtttgagaa ccggacagac tgetgggtga ctggtgggg gtacatcaa 540
gaggatgagg cactgccatc tccccacacc ctccaggaaag ttcaggctgc catcataaac 600
aactctatgt gcaaccacct ctctctcaag tacagtttcc gcaaggacat ctttgagagac 660
atggtttgtg ctggcaatgc ccaaggcggg aaggatgcct gcttcggtga ctcagggtga 720
ccottggcct gtaacaagaa tggactgtgg tatcagattg gagtcgtgag ctggggagtg 780
ggctgtggtc ggcccaatcg gcccggtgtc tacaccaata tcagccacca ctttgagtgg 840
atccagaagc tgatggccca gaggggcatg tccagccag accctcctg gccgtactc 900
ttttccctc ttctctgggc tctccactc ctggggcgcg tc 942

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&lt;210&gt; 47

&lt;211&gt; 282

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 47

atggagctct ctgatgtcac cctcattgag ggtgtgggta atgaggtgat ggtggtggca	60
ggtgtggtgg tgetgattct agccttggtc ctagcttggc tctctaccta cgtagcagac	120
agcggtagca accagctcct gggcgctatt gtgtcagcag gcgacacatc cgtcctccac	180
ctggggcatg tggaccacct ggtggcaggc caaggcaacc ccgagccaac tgaactcccc	240
catccatcag aggcaaatac ttccctggac aagaaagcca ga	282

&lt;210&gt; 48

&lt;211&gt; 654

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 48

atggcgctga agatagggtc gagacggtgg atgttgacgc tgatcatgca gttgggttcg	60
gtgtgtctca cacgtgccc cttttggggc tgcttcagcc agctcatgct gtacgtgag	120
agggctgagg cacgccggaa gcccgacatc ccagtgcctt acctgtattt cgacatgggg	180
gcagccgtgc tgtgcgctag tttcatgtcc tttggcgtga agcggcgctg gttcgcgctg	240
ggggccgcac tccaattggc cattagcacc tacgccgcct acatcggggg ctacgtccac	300
tacggggact ggtgaagggt ccgtatgtac tcgcgcacag ttgccatcat cggcgggactt	360
tottgtgttg gccagcgggt ctggggagct gtaccgcggg aaacctcga gccgtccct	420
gcagtccacc ggccagggtgt tcctgggtat ctacctcacc tgtgtggcct actcaactga	480
gcacagcaag gaggaccggc tggcgtatct gaaccatctc ccaggagggg agctgatgat	540
ccagctgttc ttctgtctgt atggcatcct ggccctggcc tttctgtcag gctactacgt	600
gaccctcgt gccagatcc tggctgtact gctgccccct gtcatgtctc tcat	654

&lt;210&gt; 49

&lt;211&gt; 1380

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 49

atgttcacaa ttaagctcct tctttttatt gtctctctag ttatttctc cagaattgat	60
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75/233

caagacaatt catcatttga ttctctatct ccagagccaa aatcaagatt tgctatgtta	120
gacgatgtaa aaatttttagc caatggcctc cttcagttgg gacatggctt taaagacttt	180
gtccataaga cgaagggccca aattaatgac atatttcaaa aactcaacat atttgatcag	240
tcttttttatg atctatcgct gcaaacccagt gaaatcaaaag aagaagaaaa ggaactgaga	300
agaactacat ataaactaca agtcaaaaaat gaagaggtaa agaatatgtc acttgaactc	360
aactcaaaac ttgaaagcct cctagaagaa aaaattctac ttcaacaaaa agtgaatat	420
ttagaagagc aactaactaa ctttaattcaa aatcaacctg aaactccaga acaccagaa	480
gtaacttcac ttaaaacttt tgtagaaaaa caagataata gcatcaaaaga ccttctccag	540
accgtggaag accaatataa acaattaaac caacagcata gtcaaatataa agaaatagaa	600
aatcagctca gaaggactag tattcaagaa cccacagaaa tttctctatc ttccaagcca	660
agagcaccaa gaactactcc ctttcttcag ttgaatgaaa taagaaatgt aaaacatgat	720
ggcattcctg ctgaatgtac caccatttat aacagagggtg aacatacaag tggcatgtat	780
gccatcagac ccagcaactc tcaagttttt catgtctact gtgatgttat atcaggtagt	840
ccatggacat taattcaaca tcgaatagat ggatcacaaa acttcaatga aacgtgggag	900
aactacaaat atgggttttg gaggttgat ggagaatttt ggttgggcct agagaagata	960
tactccatag tgaagcaatc taattatgtt ttacgaattg agctggaaga ctggaagac	1020
aacaaacatt atattgaata ttctttttac ttgggaaatc acgaaaccaa ctatacgcta	1080
catctagtgt cgattactgg caatgtcccc aatgcaatcc cggaaaacaa agatttggtg	1140
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ggctggtggt ggcattgatga gtgtggagaa aacaacctaa atggtaaata taacaaacca	1260
agagcaaaat ctaagccaga gaggagaaga ggattatctt ggaagtctca aaatggaagg	1320
ttatactcta taaaatcaac caaatgttg atccatccaa cagattcaga aagctttgaa	1380

&lt;210&gt; 50

&lt;211&gt; 648

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 50

atggtgccaa tgcacttact ggggagactg gagaagccgc ttctcctcct gtgctgcgcc	60
tccttcttac tggggctggc tttgctgggc ataaagacgg acatcacccc cgttgcttat	120
ttctttotca cattgggtgg cttctctctt tttgcctatc tcctggtccg gttcttgaa	180
tgggggcttc ggtcccagct ccaatcaatg cagactgaga gccagggcc ctcaggcaat	240
gcacgggaca atgaagcctt tgaagtgcc gtctatgaag aggcctggt gggactagaa	300
tccagtgc gccccaaga gttggacca cccccccct acagactgt tgtgataccc	360
ccagcacctg aggaggaaca acctagccat ccagaggggt ccaggagagc caaactggaa	420



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cagagggcgaa tggcctcaga ggggtccatg gccaggaag gaagccctgg aagagctcca 480  
 atcaaccttc ggcttcgggg accacgggct gtgtccactg ctctgatct gcagagcttg 540  
 gcggcagtc ccacattaga gcctctgact ccacccctg cctatgatgt ctgctttggt 600  
 caccctgatg atgatatgt tttttatgag gacaactggg caccacct 648

&lt;210&gt; 51

&lt;211&gt; 4473

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (45)...(4382)

&lt;400&gt; 51

aacttccccg gcagcggact gtagccagg cagacgccgt cgag atg cag ggc cca 56  
 Met Gln Gly Pro

1

cgc ctg acc gcc gcc cac ctg ctg tgc gtg tgc acc gcc gcg ctg 104  
 Pro Leu Leu Thr Ala Ala His Leu Leu Cys Val Cys Thr Ala Ala Leu  
 5 10 15 20

gcc gtg gct ccc ggg cct cgg ttt ctg gtg aca gcc cca ggg atc atc 152  
 Ala Val Ala Pro Gly Pro Arg Phe Leu Val Thr Ala Pro Gly Ile Ile  
 25 30 35

agg ccc gga gga aat gtg act att ggg gtg gag ctt ctg gaa cac tgc 200  
 Arg Pro Gly Gly Asn Val Thr Ile Gly Val Glu Leu Leu Glu His Cys  
 40 45 50

cct tca cag gtg act gtg aag gcg gag ctg ctg aag aca gca tca aac 248  
 Pro Ser Gln Val Thr Val Lys Ala Glu Leu Leu Lys Thr Ala Ser Asn  
 55 60 65

ctc act gtc tct gtc ctg gaa gca gaa gga gtc ttt gaa aaa ggc tct 296  
 Leu Thr Val Ser Val Leu Glu Ala Glu Gly Val Phe Glu Lys Gly Ser  
 70 75 80

ttt aag aca ctt act ctt cca tca cta cct ctg aac agt gca gat gag 344  
 Phe Lys Thr Leu Thr Leu Pro Ser Leu Pro Leu Asn Ser Ala Asp Glu  
 85 90 95 100

att tat gag cta cgt gta acc gga cgt acc cag gat gag att tta ttc 392

77/233

Ile Tyr Glu Leu Arg Val Thr Gly Arg Thr Gln Asp Glu Ile Leu Phe	
105 110 115	
tct aat agt acc cgc tta tca ttt gag acc aag aga ata tct gtc ttc	440
Ser Asn Ser Thr Arg Leu Ser Phe Glu Thr Lys Arg Ile Ser Val Phe	
120 125 130	
att caa aca gac aag gcc tta tac aag cca aag caa gaa gtg aag ttt	488
Ile Gln Thr Asp Lys Ala Leu Tyr Lys Pro Lys Gln Glu Val Lys Phe	
135 140 145	
cgc att gtt aca ctc ttc tca gat ttt aag cct tac aaa acc tct tta	536
Arg Ile Val Thr Leu Phe Ser Asp Phe Lys Pro Tyr Lys Thr Ser Leu	
150 155 160	
aac att ctc att aag gac ccc aaa tca aat ttg atc caa cag tgg ttg	584
Asn Ile Leu Ile Lys Asp Pro Lys Ser Asn Leu Ile Gln Gln Trp Leu	
165 170 175 180	
tca caa caa agt gat ctt gga gtc att tcc aaa act ttt cag cta tct	632
Ser Gln Gln Ser Asp Leu Gly Val Ile Ser Lys Thr Phe Gln Leu Ser	
185 190 195	
tcc cat cca ata ctt ggt gac tgg tct att caa gtt caa gtg aat gac	680
Ser His Pro Ile Leu Gly Asp Trp Ser Ile Gln Val Gln Val Asn Asp	
200 205 210	
cag aca tat tat caa tca ttt cag gtt tca gaa tat gta tta cca aaa	728
Gln Thr Tyr Tyr Gln Ser Phe Gln Val Ser Glu Tyr Val Leu Pro Lys	
215 220 225	
ttt gaa gtg act ttg cag aca cca tta tat tgt tct atg aat tct aag	776
Phe Glu Val Thr Leu Gln Thr Pro Leu Tyr Cys Ser Met Asn Ser Lys	
230 235 240	
cat tta aat ggt acc atc acg gca aag tat aca tat ggg aag cca gtg	824
His Leu Asn Gly Thr Ile Thr Ala Lys Tyr Thr Tyr Gly Lys Pro Val	
245 250 255 260	
aaa gga gac gta acg ctt aca ttt tta cct tta tcc ttt tgg gga aag	872
Lys Gly Asp Val Thr Leu Thr Phe Leu Pro Leu Ser Phe Trp Gly Lys	
265 270 275	
aag aaa aat att aca aaa aca ttt aag ata aat gga tct gca aac ttc	920
Lys Lys Asn Ile Thr Lys Thr Phe Lys Ile Asn Gly Ser Ala Asn Phe	
280 285 290	

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tot ttt aat gat gaa gag atg aaa aat gta atg gat tct tca aat gga	968
Ser Phe Asn Asp Glu Glu Met Lys Asn Val Met Asp Ser Ser Asn Gly	
295 300 305	
ctt tot gaa tac ctg gat cta tct ttc cct gga cca gta gaa att tta	1016
Leu Ser Glu Tyr Leu Asp Leu Ser Phe Pro Gly Pro Val Glu Ile Leu	
310 315 320	
acc aca gtg aca gaa tca gtt aca ggt att tca aga aat gta agc act	1064
Thr Thr Val Thr Glu Ser Val Thr Gly Ile Ser Arg Asn Val Ser Thr	
325 330 335 340	
aat gtg ttc ttc aag caa cat gat tac atc att gag ttt ttt gat tat	1112
Asn Val Phe Phe Lys Gln His Asp Tyr Ile Ile Glu Phe Phe Asp Tyr	
345 350 355	
act act gtc ttg aag cca tct ctc aac ttc aca gcc act gtg aag gta	1160
Thr Thr Val Leu Lys Pro Ser Leu Asn Phe Thr Ala Thr Val Lys Val	
360 365 370	
act cgt gct gat ggc aac caa ctg act ctt gaa gaa aga aga aat aat	1208
Thr Arg Ala Asp Gly Asn Gln Leu Thr Leu Glu Glu Arg Arg Asn Asn	
375 380 385	
gta gtc ata aca gtg aca cag aga aac tat act gag tac tgg agc gga	1256
Val Val Ile Thr Val Thr Gln Arg Asn Tyr Thr Glu Tyr Trp Ser Gly	
390 395 400	
tct aac agt gga aat cag aaa atg gaa gct gtt cag aaa ata aat tat	1304
Ser Asn Ser Gly Asn Gln Lys Met Glu Ala Val Gln Lys Ile Asn Tyr	
405 410 415 420	
act gtc ccc caa agt gga act ttt aag att gaa ttc cca atc ctg gag	1352
Thr Val Pro Gln Ser Gly Thr Phe Lys Ile Glu Phe Pro Ile Leu Glu	
425 430 435	
gat tcc agt gag cta cag ttg aag gcc tat ttc ctt ggt agt aaa agt	1400
Asp Ser Ser Glu Leu Gln Leu Lys Ala Tyr Phe Leu Gly Ser Lys Ser	
440 445 450	
agc atg gca gtt cat agt ctg ttt aag tct cct agt aag aca tac atc	1448
Ser Met Ala Val His Ser Leu Phe Lys Ser Pro Ser Lys Thr Tyr Ile	
455 460 465	
caa cta aaa aca aga gat gaa aat ata aag gtg gga tcg cct ttt gag	1496
Gln Leu Lys Thr Arg Asp Glu Asn Ile Lys Val Gly Ser Pro Phe Glu	

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470	475	480	
ttg gtg gtt agt ggc aac aaa cga ttg aag gag tta agc tat atg gta			1544
Leu Val Val Ser Gly Asn Lys Arg Leu Lys Glu Leu Ser Tyr Met Val			
485	490	495	500
gta tcc agg gga cag ttg gtg gct gta gga aaa caa aat tca aca atg			1592
Val Ser Arg Gly Gln Leu Val Ala Val Gly Lys Gln Asn Ser Thr Met			
505	510	515	
ttc tct tta aca cca gaa aat tct tgg act cca aaa gcc tgt gta att			1640
Phe Ser Leu Thr Pro Glu Asn Ser Trp Thr Pro Lys Ala Cys Val Ile			
520	525	530	
gtg tat tat att gaa gat gat ggg gaa att ata agt gat gtt cta aaa			1688
Val Tyr Tyr Ile Glu Asp Asp Gly Glu Ile Ile Ser Asp Val Leu Lys			
535	540	545	
att cct gtt cag ctt gtt ttt aaa aat aag ata aag cta tat tgg agt			1736
Ile Pro Val Gln Leu Val Phe Lys Asn Lys Ile Lys Leu Tyr Trp Ser			
550	555	560	
aaa gtg aaa gct gaa cca tct gag aaa gtc tct ctt agg atc tct gtg			1784
Lys Val Lys Ala Glu Pro Ser Glu Lys Val Ser Leu Arg Ile Ser Val			
565	570	575	580
aca cag cct gac tcc ata gtt ggg att gta gct gtt gac aaa agt gtg			1832
Thr Gln Pro Asp Ser Ile Val Gly Ile Val Ala Val Asp Lys Ser Val			
585	590	595	
aat ctg atg aat gcc tct aat gat att aca atg gaa aat gtg gtc cat			1880
Asn Leu Met Asn Ala Ser Asn Asp Ile Thr Met Glu Asn Val Val His			
600	605	610	
gag ttg gaa ctt tat aac aca gga tat tat tta ggc atg ttc atg aat			1928
Glu Leu Glu Leu Tyr Asn Thr Gly Tyr Tyr Leu Gly Met Phe Met Asn			
615	620	625	
tct ttt gca gtc ttt cag gaa tgt gga ctc tgg gta ttg aca gat gca			1976
Ser Phe Ala Val Phe Gln Glu Cys Gly Leu Trp Val Leu Thr Asp Ala			
630	635	640	
aac ctc acg aag gat tat att gat ggt gtt tat gac aat gca gaa tat			2024
Asn Leu Thr Lys Asp Tyr Ile Asp Gly Val Tyr Asp Asn Ala Glu Tyr			
645	650	655	660
gct gag agg ttt atg gag gaa aat gaa gga cat att gta gat att cat			2072

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Ala Glu Arg Phe Met Glu Glu Asn Glu Gly His Ile Val Asp Ile His	
665 670 675	
gac ttt tct ttg ggt agc agt cca cat gtc cga aag cat ttt cca gag	2120
Asp Phe Ser Leu Gly Ser Ser Pro His Val Arg Lys His Phe Pro Glu	
680 685 690	
act tgg att tgg cta gac acc aac atg ggt tcc agg att tac caa gaa	2168
Thr Trp Ile Trp Leu Asp Thr Asn Met Gly Ser Arg Ile Tyr Gln Glu	
695 700 705	
ttt gaa gta act gta cct gat tct atc act tct tgg gtg gct act ggt	2216
Phe Glu Val Thr Val Pro Asp Ser Ile Thr Ser Trp Val Ala Thr Gly	
710 715 720	
ttt gtg atc tct gag gac ctg ggt ctt gga cta aca act act cca gtg	2264
Phe Val Ile Ser Glu Asp Leu Gly Leu Gly Leu Thr Thr Thr Pro Val	
725 730 735 740	
gag ctc caa gcc ttc caa cca ttt ttc att ttt ttg aat ctt ccc tac	2312
Glu Leu Gln Ala Phe Gln Pro Phe Phe Ile Phe Leu Asn Leu Pro Tyr	
745 750 755	
tct gtt atc aga ggt gaa gaa ttt gct ttg gaa ata act ata ttc aat	2360
Ser Val Ile Arg Gly Glu Glu Phe Ala Leu Glu Ile Thr Ile Phe Asn	
760 765 770	
tat ttg aaa gat gcc act gag gtt aag gta atc att gag aaa agt gac	2408
Tyr Leu Lys Asp Ala Thr Glu Val Lys Val Ile Ile Glu Lys Ser Asp	
775 780 785	
aaa ttt gat att cta atg act tca agt gaa ata aat gcc aca ggc cac	2456
Lys Phe Asp Ile Leu Met Thr Ser Ser Glu Ile Asn Ala Thr Gly His	
790 795 800	
cag cag acc ctt ctg gtt ccc agt gag gat ggg gca act gtt ctt ttt	2504
Gln Gln Thr Leu Leu Val Pro Ser Glu Asp Gly Ala Thr Val Leu Phe	
805 810 815 820	
ccc atc agg cca aca cat ctg gga gaa att cct atc aca gtc aca gct	2552
Pro Ile Arg Pro Thr His Leu Gly Glu Ile Pro Ile Thr Val Thr Ala	
825 830 835	
ctt tca ccc act gct tct gat gct atc acc cag atg att tta gta aag	2600
Leu Ser Pro Thr Ala Ser Asp Ala Ile Thr Gln Met Ile Leu Val Lys	
840 845 850	

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gct gaa gga ata gaa aaa tca tat tca caa tcc atc tta tta gac ttg	2648
Ala Glu Gly Ile Glu Lys Ser Tyr Ser Gln Ser Ile Leu Leu Asp Leu	
855 860 865	
act gac aat agg cta cag agt acc ctg aaa act ttg agt ttc tca ttt	2696
Thr Asp Asn Arg Leu Gln Ser Thr Leu Lys Thr Leu Ser Phe Ser Phe	
870 875 880	
cct cct aat aca gtg act ggc agt gaa aga gtt cag atc act gca att	2744
Pro Pro Asn Thr Val Thr Gly Ser Glu Arg Val Gln Ile Thr Ala Ile	
885 890 895 900	
gga gat gtt ctt ggt cct tcc atc aat ggc tta gcc tca ttg att cgg	2792
Gly Asp Val Leu Gly Pro Ser Ile Asn Gly Leu Ala Ser Leu Ile Arg	
905 910 915	
atg cct tat ggc tgt ggt gaa cag aac atg ata aat ttt gct cca aat	2840
Met Pro Tyr Gly Cys Gly Glu Gln Asn Met Ile Asn Phe Ala Pro Asn	
920 925 930	
att tac att ttg gat tat ctg act aaa aag aaa caa ctg aca gat aat	2888
Ile Tyr Ile Leu Asp Tyr Leu Thr Lys Lys Lys Gln Leu Thr Asp Asn	
935 940 945	
ttg aaa gaa aaa gct ctt tca ttt atg agg caa ggt tac cag aga gaa	2936
Leu Lys Glu Lys Ala Leu Ser Phe Met Arg Gln Gly Tyr Gln Arg Glu	
950 955 960	
ctt ctc tat cag agg gaa gat ggc tct ttc agt gct ttt ggg aat tat	2984
Leu Leu Tyr Gln Arg Glu Asp Gly Ser Phe Ser Ala Phe Gly Asn Tyr	
965 970 975 980	
gac cct tct ggg agc act tgg ttg tca gct ttt gtt tta aga tgt ttc	3032
Asp Pro Ser Gly Ser Thr Trp Leu Ser Ala Phe Val Leu Arg Cys Phe	
985 990 995	
ctt gaa gcc gat cct tac ata gat att gat cag aat gtg tta cac aga	3080
Leu Glu Ala Asp Pro Tyr Ile Asp Ile Asp Gln Asn Val Leu His Arg	
1000 1005 1010	
aca tac act tgg ctt aaa gga cat cag aaa tcc aac ggt gaa ttt tgg	3128
Thr Tyr Thr Trp Leu Lys Gly His Gln Lys Ser Asn Gly Glu Phe Trp	
1015 1020 1025	
gat cca gga aga gtg att cat agt gag ctt caa ggt ggc aat aaa agt	3176
Asp Pro Gly Arg Val Ile His Ser Glu Leu Gln Gly Gly Asn Lys Ser	

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1030	1035	1040	
cca gta aca ctt aca gcc tat att gta act tct ctc ctg gga tat aga			3224
Pro Val Thr Leu Thr Ala Tyr Ile Val Thr Ser Leu Leu Gly Tyr Arg			
1045	1050	1055	1060
aag tat cag cct aac att gat gtg caa gag tct atc cat ttt ttg gag			3272
Lys Tyr Gln Pro Asn Ile Asp Val Gln Glu Ser Ile His Phe Leu Glu			
1065	1070	1075	
tct gaa ttc agt aga gga att tca gac aat tat act cta gcc ctt ata			3320
Ser Glu Phe Ser Arg Gly Ile Ser Asp Asn Tyr Thr Leu Ala Leu Ile			
1080	1085	1090	
act tat gca ttg tca tca gtg ggg agt cct aaa gcg aag gaa gct ttg			3368
Thr Tyr Ala Leu Ser Ser Val Gly Ser Pro Lys Ala Lys Glu Ala Leu			
1095	1100	1105	
aat atg ctg act tgg aga gca gaa caa gaa ggt ggc atg caa ttc tgg			3416
Asn Met Leu Thr Trp Arg Ala Glu Gln Glu Gly Gly Met Gln Phe Trp			
1110	1115	1120	
gtg tca tca gag tcc aaa ctt tot gac tcc tgg cag cca cgc tcc ctg			3464
Val Ser Ser Glu Ser Lys Leu Ser Asp Ser Trp Gln Pro Arg Ser Leu			
1125	1130	1135	1140
gat att gaa gtt gca gcc tat gca ctg ctc tca cac ttc tta caa ttt			3512
Asp Ile Glu Val Ala Ala Tyr Ala Leu Leu Ser His Phe Leu Gln Phe			
1145	1150	1155	
cag act tct gag gga atc cca att atg agg tgg cta agc agg caa aga			3560
Gln Thr Ser Glu Gly Ile Pro Ile Met Arg Trp Leu Ser Arg Gln Arg			
1160	1165	1170	
aat agc ttg ggt ggt ttt gca tct act cag gat acc act gtg gct tta			3608
Asn Ser Leu Gly Gly Phe Ala Ser Thr Gln Asp Thr Thr Val Ala Leu			
1175	1180	1185	
aag gct ctg tct gaa ttt gca gcc cta atg aat aca gaa agg aca aat			3656
Lys Ala Leu Ser Glu Phe Ala Ala Leu Met Asn Thr Glu Arg Thr Asn			
1190	1195	1200	
atc caa gtg acc gtg acg ggg cct agc tca cca agt cct gta aag ttt			3704
Ile Gln Val Thr Val Thr Gly Pro Ser Ser Pro Ser Pro Val Lys Phe			
1205	1210	1215	1220
ctg att gac aca cac aac cgc tta ctc ctt cag aca gca gag ctt gct			3752

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Leu Ile Asp Thr His Asn Arg Leu Leu Leu Gln Thr Ala Glu Leu Ala	
1225 1230 1235	
gtg gta cag cca acg gca gtt aat att tcc gca aat ggt ttt gga ttt	3800
Val Val Gln Pro Thr Ala Val Asn Ile Ser Ala Asn Gly Phe Gly Phe	
1240 1245 1250	
gct att tgt cag ctc aat gtt gta tat aat gtg aag gct tct ggg tct	3848
Ala Ile Cys Gln Leu Asn Val Val Tyr Asn Val Lys Ala Ser Gly Ser	
1255 1260 1265	
tct aga aga cga aga tct atc caa aat caa gaa gcc ttt gat tta gat	3896
Ser Arg Arg Arg Arg Ser Ile Gln Asn Gln Glu Ala Phe Asp Leu Asp	
1270 1275 1280	
gtt gct gta aaa gaa aat aaa gat gat ctc aat cat gtg gat ttg aat	3944
Val Ala Val Lys Glu Asn Lys Asp Asp Leu Asn His Val Asp Leu Asn	
1285 1290 1295 1300	
gtg tgt aca agc ttt tcg ggc ccg ggt agg agt ggc atg gct ctt atg	3992
Val Cys Thr Ser Phe Ser Gly Pro Gly Arg Ser Gly Met Ala Leu Met	
1305 1310 1315	
gaa gtt aac cta tta agt ggc ttt atg gtg cct tca gaa gca att tct	4040
Glu Val Asn Leu Leu Ser Gly Phe Met Val Pro Ser Glu Ala Ile Ser	
1320 1325 1330	
ctg agc gag aca gtg aag aaa gtg gaa tat gat cat gga aaa ctc aac	4088
Leu Ser Glu Thr Val Lys Lys Val Glu Tyr Asp His Gly Lys Leu Asn	
1335 1340 1345	
ctc tat tta gat tct gta aat gaa acc cag ttt tgt gtt aat att cct	4136
Leu Tyr Leu Asp Ser Val Asn Glu Thr Gln Phe Cys Val Asn Ile Pro	
1350 1355 1360	
gct gtg aga aac ttt aaa gtt tca aat acc caa gat gct tca gtg tcc	4184
Ala Val Arg Asn Phe Lys Val Ser Asn Thr Gln Asp Ala Ser Val Ser	
1365 1370 1375 1380	
ata gtg gat tac tat gag cca agg aga cag gcg gtg aga agt tac aac	4232
Ile Val Asp Tyr Tyr Glu Pro Arg Arg Gln Ala Val Arg Ser Tyr Asn	
1385 1390 1395	
tct gaa gtg aag ctg tcc tcc tgt gac ctt tgc agt gat gtc cag ggc	4280
Ser Glu Val Lys Leu Ser Ser Cys Asp Leu Cys Ser Asp Val Gln Gly	
1400 1405 1410	



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tgc cgt cct tgt gag gat gga gct tca ggc tcc cat cat cac tct tca 4328  
 Cys Arg Pro Cys Glu Asp Gly Ala Ser Gly Ser His His His Ser Ser  
 1415 1420 1425  
 gtc att ttt att ttc tgt ttc aag ctt ctg tac ttt atg gaa ctt tgg 4376  
 Val Ile Phe Ile Phe Cys Phe Lys Leu Leu Tyr Phe Met Glu Leu Trp  
 1430 1435 1440  
 ctg tgatttattt ttaaaggact ctgtgtaaca ctaacatttc cagtagtcac a 4430  
 Leu  
 1445  
 tgtgattgtt ttgttttcgt agaagaatac tgcttctatt ttg 4473

&lt;210&gt; 52

&lt;211&gt; 2630

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (82)...(1830)

&lt;400&gt; 52

agttctggga ggcgggggga aggaggttgg tggcgactcc ctcgctcgcc ctcactgcag 60  
 gcggtcccaa ctccaggcac c atg ttc ccc gcg ggc ccc ccc agc cac agc 111  
 Met Phe Pro Ala Gly Pro Pro Ser His Ser  
 1 5 10  
 ctc ctc egg ctc ccc ctg ctg cag ttg ctg cta ctg gtg gtg cag gcc 159  
 Leu Leu Arg Leu Pro Leu Leu Gln Leu Leu Leu Val Val Gln Ala  
 15 20 25  
 gtg ggg agg ggg ctg ggc cgc gcc agc ccg gcc ggg ggc ccc ctg gaa 207  
 Val Gly Arg Gly Leu Gly Arg Ala Ser Pro Ala Gly Gly Pro Leu Glu  
 30 35 40  
 gat gtg gtc atc gag agg tac cac atc ccc agg gcc tgt ccc cgg gaa 255  
 Asp Val Val Ile Glu Arg Tyr His Ile Pro Arg Ala Cys Pro Arg Glu  
 45 50 55  
 gtg cag atg ggg gat ttt gtg cgc tac cac tac aac ggc act ttt gaa 303  
 Val Gln Met Gly Asp Phe Val Arg Tyr His Tyr Asn Gly Thr Phe Glu  
 60 65 70

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gat ggc aag aag ttt gat tca agc tat gat cgc aac acc ttg gtg gcc	351
Asp Gly Lys Lys Phe Asp Ser Ser Tyr Asp Arg Asn Thr Leu Val Ala	
75 80 85 90	
atc gtg gtg ggt gtg ggg cgc ctc atc act ggc atg gac cga ggc ctc	399
Ile Val Val Gly Val Gly Arg Leu Ile Thr Gly Met Asp Arg Gly Leu	
95 100 105	
atg ggc atg tgt gtc aac gag cgg cga cgc ctc att gtg cct ccc cac	447
Met Gly Met Cys Val Asn Glu Arg Arg Arg Leu Ile Val Pro Pro His	
110 115 120	
ctg ggc tat ggg agc atc ggc ctg gcg ggg ctc att cca ccg gat gcc	495
Leu Gly Tyr Gly Ser Ile Gly Leu Ala Gly Leu Ile Pro Pro Asp Ala	
125 130 135	
acc ctc tac ttc gat gtg gtt ctg ctg gat gtg tgg aac aag gaa gac	543
Thr Leu Tyr Phe Asp Val Val Leu Leu Asp Val Trp Asn Lys Glu Asp	
140 145 150	
acc gtg cag gtg agc aca ttg ctg cgc ccg ccc cac tgc ccc cgc atg	591
Thr Val Gln Val Ser Thr Leu Leu Arg Pro Pro His Cys Pro Arg Met	
155 160 165 170	
gtc cag gac ggc gac ttt gtc cgc tac cac tac aat ggc acc ctg ctg	639
Val Gln Asp Gly Asp Phe Val Arg Tyr His Tyr Asn Gly Thr Leu Leu	
175 180 185	
gac ggc acc tcc ttc gac acc agc tac agt aag ggc ggc act tat gac	687
Asp Gly Thr Ser Phe Asp Thr Ser Tyr Ser Lys Gly Gly Thr Tyr Asp	
190 195 200	
acc tac gtc ggc tct ggt tgg ctg atc aag ggc atg gac cag ggg ctg	735
Thr Tyr Val Gly Ser Gly Trp Leu Ile Lys Gly Met Asp Gln Gly Leu	
205 210 215	
ctg ggc atg tgt cct gga gag aga agg aag att atc atc cct cca ttc	783
Leu Gly Met Cys Pro Gly Glu Arg Arg Lys Ile Ile Ile Pro Pro Phe	
220 225 230	
ctg gcc tat ggc gag aaa ggc tat ggg acg gtg atc ccc cca cag gcc	831
Leu Ala Tyr Gly Glu Lys Gly Tyr Gly Thr Val Ile Pro Pro Gln Ala	
235 240 245 250	
tcg ctg gtc ttt cac gtc ctc ctg att gac gtg cac aac ccg aag gac	879
Ser Leu Val Phe His Val Leu Leu Ile Asp Val His Asn Pro Lys Asp	

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255	260	265	
gct gtc cag cta gag acg ctg gag ctc ccc ccc ggc tgt gtc cgc aga			927
Ala Val Gln Leu Glu Thr Leu Glu Leu Pro Pro Gly Cys Val Arg Arg			
270	275	280	
gcc ggg gcc ggg gac ttc atg cgc tac cac tac aat ggc tcc ttg atg			975
Ala Gly Ala Gly Asp Phe Met Arg Tyr His Tyr Asn Gly Ser Leu Met			
285	290	295	
gac ggc acc ctc ttc gat tcc agc tac tcc cgc aac cac acc tac aat			1023
Asp Gly Thr Leu Phe Asp Ser Ser Tyr Ser Arg Asn His Thr Tyr Asn			
300	305	310	
acc tat atc ggg cag ggt tac atc atc ccc ggg atg gac cag ggg ctg			1071
Thr Tyr Ile Gly Gln Gly Tyr Ile Ile Pro Gly Met Asp Gln Gly Leu			
315	320	325	330
cag ggt gcc tgc atg ggg gaa cgc cgg aga att acc atc ccc ccg cac			1119
Gln Gly Ala Cys Met Gly Glu Arg Arg Arg Ile Thr Ile Pro Pro His			
335	340	345	
ctc gcc tat ggg gag aat gga act gga gac aag atc cct ggc tot gcc			1167
Leu Ala Tyr Gly Glu Asn Gly Thr Gly Asp Lys Ile Pro Gly Ser Ala			
350	355	360	
gtg cta atc ttc aac gtc cat gtc att gac ttc cac aac cct gcg gat			1215
Val Leu Ile Phe Asn Val His Val Ile Asp Phe His Asn Pro Ala Asp			
365	370	375	
gtg gtg gaa atc agg aca ctg tcc cgg cca tct gag acc tgc aat gag			1263
Val Val Glu Ile Arg Thr Leu Ser Arg Pro Ser Glu Thr Cys Asn Glu			
380	385	390	
acc acc aag ctt ggg gac ttt gtt cga tac cat tac aac tgt tct ttg			1311
Thr Thr Lys Leu Gly Asp Phe Val Arg Tyr His Tyr Asn Cys Ser Leu			
395	400	405	410
ctg gac ggc acc cag ctg ttc acc tcg cat gac tac ggg gcc ccc cag			1359
Leu Asp Gly Thr Gln Leu Phe Thr Ser His Asp Tyr Gly Ala Pro Gln			
415	420	425	
gag gcg act ctc ggg gcc aac aag gtg atc gaa ggc ctg gac acg ggc			1407
Glu Ala Thr Leu Gly Ala Asn Lys Val Ile Glu Gly Leu Asp Thr Gly			
430	435	440	
ctg cag ggc atg tgt gtg gga gag agg cgg cag ctc atc gtg ccc ccg			1455

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Leu Gln Gly Met Cys Val Gly Glu Arg Arg Gln Leu Ile Val Pro Pro	
445 450 455	
cac ctg gcc cac ggg gag agt gga gcc cgg gga gtc cca ggc agt gct	1503
His Leu Ala His Gly Glu Ser Gly Ala Arg Gly Val Pro Gly Ser Ala	
460 465 470	
gtg ctg ctg ttt gag gtg gag ctg gtg tcc cgg gag gat ggg ctg ccc	1551
Val Leu Leu Phe Glu Val Glu Leu Val Ser Arg Glu Asp Gly Leu Pro	
475 480 485 490	
aca ggc tac ctg ttt gtg tgg cac aag gac cct cct gcc aac ctg ttt	1599
Thr Gly Tyr Leu Phe Val Trp His Lys Asp Pro Pro Ala Asn Leu Phe	
495 500 505	
gaa gac atg gac ctc aac aag gat ggc gag gtc cct ccg gag gag ttc	1647
Glu Asp Met Asp Leu Asn Lys Asp Gly Glu Val Pro Pro Glu Glu Phe	
510 515 520	
tcc acc ttc atc aag gct caa gtg agt gag ggc aaa gga cgc ctc atg	1695
Ser Thr Phe Ile Lys Ala Gln Val Ser Glu Gly Lys Gly Arg Leu Met	
525 530 535	
cct ggg cag gac cct gag aaa acc ata gga gac atg ttc cag aac cag	1743
Pro Gly Gln Asp Pro Glu Lys Thr Ile Gly Asp Met Phe Gln Asn Gln	
540 545 550	
gac cgc aac cag gac ggc aag atc aca gtc gac gag ctc aag ctg aag	1791
Asp Arg Asn Gln Asp Gly Lys Ile Thr Val Asp Glu Leu Lys Leu Lys	
555 560 565 570	
tca gat gag gac gag gag cgg gtc cac gag gag ctc tga ggggcaggga	1840
Ser Asp Glu Asp Glu Glu Arg Val His Glu Glu Leu	
575 580	
gcctggccag gcctgagaca cagaggccca ctgcgagggg gacagtggcg gtgggactga	1900
cctgctgaca gtcacccctcc ctctgctggg atgaggtcca ggagccaact aaaacaatgg	1960
cagaggagac atctctggtg tccccaccac cctagatgaa aatccacagc acagacctct	2020
accgtgtttc tcttccatcc ctaaaccact tccttaaaat gtttggattt gcaaagccaa	2080
tttggggcct gtggagcctg gggttggata gggccatggc tgggtcccca ccatacctcc	2140
cctccacatc actgacacag ctgagcttgt tatccatctc cccaaacttt ctctttcttt	2200
gtacttcttg tcattccccc tcccagcccc tattctcteta tigtacagct ggctaggacc	2260
cctctgcctt cctccccaat cctgactggc tcctagggaa ggggaaggct cctggagggc	2320
agcctacct ctcccatgcc ctttgccctc ctccctcgcc tccagtggag gctgagctga	2380

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ccctgggctg ctggaggcca gactgggctg tagttagctt ttcaccccta aagaaggctt 2440  
 tccctaagga accatagaag agaggaagaa aacaaagggc atgtgtgagg gaagctgctt 2500  
 ggggtgggtgt tagggctatg aaatcttgga tttggggctg aggggtggga gggagggcag 2560  
 agctctgcac actcaaaggc taaactggtg tcagtccttt tttcctttgt tccaaataaa 2620  
 agattaaacc 2630

&lt;210&gt; 53

&lt;211&gt; 1472

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (89)...(1321)

&lt;400&gt; 53

aaaaagactc cgccttccca agagccctg cggccgggcg cgaaaatggc ggcggcggcg 60  
 acggccgggc gtcctgaag cagcagtt atg gag ctt ccc tca ggg ccg ggg 112

Met Glu Leu Pro Ser Gly Pro Gly

1

5

ccg gag cgg ctc ttt gac tcg cac cgg ctt ccg ggt gac tgc ttc cta 160  
 Pro Glu Arg Leu Phe Asp Ser His Arg Leu Pro Gly Asp Cys Phe Leu

10

15

20

ctg ctc gtg ctg ctg ctc tac gcg cca gtc ggg ttc tgc ctc ctc gtc 208  
 Leu Leu Val Leu Leu Leu Tyr Ala Pro Val Gly Phe Cys Leu Leu Val

25

30

35

40

ctg cgc ctc ttt ctc ggg atc cac gtc ttc ctg gtc agc tgc gcg ctg 256  
 Leu Arg Leu Phe Leu Gly Ile His Val Phe Leu Val Ser Cys Ala Leu

45

50

55

cca gac agc gtc ctt cgc aga ttc gta gtg cgg acc atg tgt gcg gtg 304  
 Pro Asp Ser Val Leu Arg Arg Phe Val Val Arg Thr Met Cys Ala Val

60

65

70

cta ggg ctc gtg gcc cgg cag gag gac tcc gga ctc cgg gat cac agt 352  
 Leu Gly Leu Val Ala Arg Gln Glu Asp Ser Gly Leu Arg Asp His Ser

75

80

85

gtc agg gtc ctc att tcc aac cat gtg aca cct ttc gac cac aac ata 400  
 Val Arg Val Leu Ile Ser Asn His Val Thr Pro Phe Asp His Asn Ile

89/233

90	95	100	
gtc aat ttg ctt acc acc tgt agc acc cct cta ctc aat agt ccc ccc			448
Val Asn Leu Leu Thr Thr Cys Ser Thr Pro Leu Leu Asn Ser Pro Pro			
105	110	115	120
agc ttt gtg tgc tgg tct cgg ggc ttc atg gag atg aat ggg cgg ggg			496
Ser Phe Val Cys Trp Ser Arg Gly Phe Met Glu Met Asn Gly Arg Gly			
125	130	135	
gag ttg gtg gag tca ctc aag aga ttc tgt gct tcc acg agg ctt ccc			544
Glu Leu Val Glu Ser Leu Lys Arg Phe Cys Ala Ser Thr Arg Leu Pro			
140	145	150	
ccc act cct ctg ctg cta ttc cct gag gaa gag gcc acc aat ggc cgg			592
Pro Thr Pro Leu Leu Leu Phe Pro Glu Glu Glu Ala Thr Asn Gly Arg			
155	160	165	
gag ggg ctc ctg cgc ttc agt tcc tgg cca ttt tct atc caa gat gtg			640
Glu Gly Leu Leu Arg Phe Ser Ser Trp Pro Phe Ser Ile Gln Asp Val			
170	175	180	
gta caa cct ctt acc ctg caa gtt cag aga ccc ctg gtc tct gtg acg			688
Val Gln Pro Leu Thr Leu Gln Val Gln Arg Pro Leu Val Ser Val Thr			
185	190	195	200
gtg tca gat gcc tcc tgg gtc tca gaa ctg ctg tgg tca ctt ttc gtc			736
Val Ser Asp Ala Ser Trp Val Ser Glu Leu Leu Trp Ser Leu Phe Val			
205	210	215	
cct ttc acg gtg tat caa gta agg tgg ctt cgt cct gtt cat cgc caa			784
Pro Phe Thr Val Tyr Gln Val Arg Trp Leu Arg Pro Val His Arg Gln			
220	225	230	
cta ggg gaa gcg aat gag gag ttt gca ctc cgt gta caa cag ctg gtg			832
Leu Gly Glu Ala Asn Glu Glu Phe Ala Leu Arg Val Gln Gln Leu Val			
235	240	245	
gcc aag gaa ttg ggc cag aca ggg aca cgg ctc act cca gct gac aaa			880
Ala Lys Glu Leu Gly Gln Thr Gly Thr Arg Leu Thr Pro Ala Asp Lys			
250	255	260	
gca gag cac atg aag cga caa aga cac ccc aga ttg cgc ccc cag tca			928
Ala Glu His Met Lys Arg Gln Arg His Pro Arg Leu Arg Pro Gln Ser			
265	270	275	280
gcc cag tct tct ttc cct ccc tcc cct ggt cct tct cct gat gtg caa			976

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Ala Gln Ser Ser Phe Pro Pro Ser Pro Gly Pro Ser Pro Asp Val Gln  
 285 290 295  
 ctg gca act ctg gct cag aga gtc aag gaa gtt ttg ccc cat gtg cca 1024  
 Leu Ala Thr Leu Ala Gln Arg Val Lys Glu Val Leu Pro His Val Pro  
 300 305 310  
 ttg ggt gtc atc cag aga gac ctg gcc aag act ggc tgt gta gac ttg 1072  
 Leu Gly Val Ile Gln Arg Asp Leu Ala Lys Thr Gly Cys Val Asp Leu  
 315 320 325  
 act atc act aat ctg ctt gag ggg gcc gta gct ttc atg cct gaa gac 1120  
 Thr Ile Thr Asn Leu Leu Glu Gly Ala Val Ala Phe Met Pro Glu Asp  
 330 335 340  
 atc acc aag gga act cag tcc cta ccc aca gcc tct gcc tcc aag ttt 1168  
 Ile Thr Lys Gly Thr Gln Ser Leu Pro Thr Ala Ser Ala Ser Lys Phe  
 345 350 355 360  
 ccc agc tct ggc ccg gtg acc cct cag cca aca gcc cta aca ttt gcc 1216  
 Pro Ser Ser Gly Pro Val Thr Pro Gln Pro Thr Ala Leu Thr Phe Ala  
 365 370 375  
 aag tct tcc tgg gcc cgg cag gag agc ctg cag gag cgc aag caa gca 1264  
 Lys Ser Ser Trp Ala Arg Gln Glu Ser Leu Gln Glu Arg Lys Gln Ala  
 380 385 390  
 cta tat gaa tac gca aga agg aga ttc aca gag aga cga gcc cag gag 1312  
 Leu Tyr Glu Tyr Ala Arg Arg Arg Phe Thr Glu Arg Arg Ala Gln Glu  
 395 400 405  
 gct gac tgagctcaaa ggaacaggat ggcaccacaga gccgcaggac ggagactggg gg 1370  
 Ala Asp  
 410  
 cagccctcac ccaactcaca acaggctgga tgggtgggtg gtaaaaaggg aaggatgagg 1430  
 ctcccccaat gtcacattaa attcatgggtt ttcattcaag gc 1472

&lt;210&gt; 54

&lt;211&gt; 1652

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

91/233

&lt;222&gt; (17)...(1468)

&lt;400&gt; 54

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aaagcggcgg cggagg atg gag gaa gga ggc ggc ggc gta cgg agt ctg gtc      52
      Met Glu Glu Gly Gly Gly Gly Val Arg Ser Leu Val
              1              5              10
ccg ggc ggg ccg gtg tta ctg gtc ctc tgc ggc ctc ctg gag gcg tcc      100
Pro Gly Gly Pro Val Leu Leu Val Leu Cys Gly Leu Leu Glu Ala Ser
      15              20              25
ggc ggc ggc cga gcc ctt cct caa ctc agc gat gac atc cct ttc cga      148
Gly Gly Gly Arg Ala Leu Pro Gln Leu Ser Asp Asp Ile Pro Phe Arg
      30              35              40
gtc aac tgg ccc ggc acc gag ttc tct ctg ccc aca act gga gtt tta      196
Val Asn Trp Pro Gly Thr Glu Phe Ser Leu Pro Thr Thr Gly Val Leu
      45              50              55              60
tat aaa gaa gat aat tat gtc atc atg aca act gca cat aaa gaa aaa      244
Tyr Lys Glu Asp Asn Tyr Val Ile Met Thr Thr Ala His Lys Glu Lys
      65              70              75
tat aaa tgc ata ctt ccc ctt gtg aca agt ggg gat gag gaa gaa gaa      292
Tyr Lys Cys Ile Leu Pro Leu Val Thr Ser Gly Asp Glu Glu Glu Glu
      80              85              90
aag gat tat aaa ggc cct aat cca aga gag ctt ttg gag cca cta ttt      340
Lys Asp Tyr Lys Gly Pro Asn Pro Arg Glu Leu Leu Glu Pro Leu Phe
      95              100              105
aaa caa agc agt tgt tcc tac aga att gag tct tat tgg act tac gaa      388
Lys Gln Ser Ser Cys Ser Tyr Arg Ile Glu Ser Tyr Trp Thr Tyr Glu
      110              115              120
gta tgt cat gga aaa cac att cgg cag tac cat gaa gag aaa gaa act      436
Val Cys His Gly Lys His Ile Arg Gln Tyr His Glu Glu Lys Glu Thr
      125              130              135              140
ggg cag aaa ata aat att cac gag tac tac ctt ggg aat atg ttg gcc      484
Gly Gln Lys Ile Asn Ile His Glu Tyr Tyr Leu Gly Asn Met Leu Ala
      145              150              155
aag aac ctt cta ttt gaa aaa gaa cga gaa gca gaa gaa aag gaa aaa      532
Lys Asn Leu Leu Phe Glu Lys Glu Arg Glu Ala Glu Glu Lys Glu Lys
      160              165              170

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tca aat gag att ccc act aaa aat atc gaa ggt cag atg aca cca tac	580
Ser Asn Glu Ile Pro Thr Lys Asn Ile Glu Gly Gln Met Thr Pro Tyr	
175 180 185	
tat cct gtg gga atg gga aat ggt aca cct tgt agt ttg aaa cag aac	628
Tyr Pro Val Gly Met Gly Asn Gly Thr Pro Cys Ser Leu Lys Gln Asn	
190 195 200	
cgg ccc aga tca agt act gtg atg tac ata tgt cat cct gaa tct aag	676
Arg Pro Arg Ser Ser Thr Val Met Tyr Ile Cys His Pro Glu Ser Lys	
205 210 215 220	
cat gaa att ctt tca gta gct gaa gtt aca act tgt gaa tat gaa gtt	724
His Glu Ile Leu Ser Val Ala Glu Val Thr Thr Cys Glu Tyr Glu Val	
225 230 235	
gtc att ttg aca cca ctc ttg tgc agt cat cct aaa tat agg ttc aga	772
Val Ile Leu Thr Pro Leu Leu Cys Ser His Pro Lys Tyr Arg Phe Arg	
240 245 250	
gca tct cct gtg aat gac ata ttt tgt caa tca ctg cca gga tct cca	820
Ala Ser Pro Val Asn Asp Ile Phe Cys Gln Ser Leu Pro Gly Ser Pro	
255 260 265	
ttt aag ccc ctc acc ctg agg cag ctg gag cag cag gaa gaa ata cta	868
Phe Lys Pro Leu Thr Leu Arg Gln Leu Glu Gln Gln Glu Glu Ile Leu	
270 275 280	
agg gtg cct ttt agg aga aat aaa gag gaa gat ttg caa tca act aaa	916
Arg Val Pro Phe Arg Arg Asn Lys Glu Glu Asp Leu Gln Ser Thr Lys	
285 290 295 300	
gaa gag aga ttt cca gcg atc cac aag tcg att gct att ggc tct cag	964
Glu Glu Arg Phe Pro Ala Ile His Lys Ser Ile Ala Ile Gly Ser Gln	
305 310 315	
cca gtg ctc act gtt ggg aca acc cac ata tcc aaa ttg aca gat gac	1012
Pro Val Leu Thr Val Gly Thr Thr His Ile Ser Lys Leu Thr Asp Asp	
320 325 330	
caa ctc ata aaa gag ttt ctt agt ggt tct tac tgc ttt cgt ggg ggt	1060
Gln Leu Ile Lys Glu Phe Leu Ser Gly Ser Tyr Cys Phe Arg Gly Gly	
335 340 345	
gtc ggt tgg tgg aaa tat gaa ttc tgc tat ggc aaa cat gta cat caa	1108
Val Gly Trp Trp Lys Tyr Glu Phe Cys Tyr Gly Lys His Val His Gln	

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350	355	360	
tac cat gag gac aag gat agt ggg aaa acc tct gtg gtt gtc ggg aca			1156
Tyr His Glu Asp Lys Asp Ser Gly Lys Thr Ser Val Val Val Gly Thr			
365	370	375	380
tgg aac caa gaa gag cat att gaa tgg gct aag aag aat act gct aga			1204
Trp Asn Gln Glu Glu His Ile Glu Trp Ala Lys Lys Asn Thr Ala Arg			
385	390	395	
gct tat cat ctt caa gac gat ggt acc cag aca gtc agg atg gtg tca			1252
Ala Tyr His Leu Gln Asp Asp Gly Thr Gln Thr Val Arg Met Val Ser			
400	405	410	
cat ttt tat gga aat gga gat att tgt gat ata act gac aaa oca aga			1300
His Phe Tyr Gly Asn Gly Asp Ile Cys Asp Ile Thr Asp Lys Pro Arg			
415	420	425	
cag gtg act gta aaa cta aag tgc aaa gaa tca gat tca cct cat gct			1348
Gln Val Thr Val Lys Leu Lys Cys Lys Glu Ser Asp Ser Pro His Ala			
430	435	440	
gtt act gta tat atg cta gag cct cac tcc tgt caa tat att ctt ggg			1396
Val Thr Val Tyr Met Leu Glu Pro His Ser Cys Gln Tyr Ile Leu Gly			
445	450	455	460
gtt gaa tct cca gtg atc tgt aaa atc tta gat aca gca gat gaa aat			1444
Val Glu Ser Pro Val Ile Cys Lys Ile Leu Asp Thr Ala Asp Glu Asn			
465	470	475	
gga ctt ctt tct ctc ccc aac taaaggatat taaagttagg ggaaa			1490
Gly Leu Leu Ser Leu Pro Asn			
480			
gaaaagatca ttgaaagtca tgataatttc tgtcccactg tgtctcatta tagagttctc			1550
agccattgga cctcttctaa aggatggat aaaatgactc tcaaccactt tgtgaataca			1610
tatgtgtata taagaggta ttgataaact tctgaggcag ac			1652

&lt;210&gt; 55

&lt;211&gt; 2112

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

94/233

&lt;222&gt; (20)...(1843)

&lt;400&gt; 55

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attttggtgg gtgagcagc atg ggc ttt gag gag ctg ctg gag cag gtg ggc      52
      Met Gly Phe Glu Glu Leu Leu Glu Gln Val Gly
              1              5              10

ggc ttt ggg ccc ttc caa ctg cgg aat gtg gca ctg ctg gcc ctg ccc      100
Gly Phe Gly Pro Phe Gln Leu Arg Asn Val Ala Leu Leu Ala Leu Pro
              15              20              25

cga gtg ctg cta cca ctg cac ttc ctc ctg ccc atc ttc ctg gct gcc      148
Arg Val Leu Leu Pro Leu His Phe Leu Leu Pro Ile Phe Leu Ala Ala
              30              35              40

gtg cct gcc cac cga tgt gcc ctg ccg ggt gcc cct gcc aac ttc agc      196
Val Pro Ala His Arg Cys Ala Leu Pro Gly Ala Pro Ala Asn Phe Ser
              45              50              55

cat cag gat gtg tgg ctg gag gcc cat ctt ccc cgg gag cct gat ggc      244
His Gln Asp Val Trp Leu Glu Ala His Leu Pro Arg Glu Pro Asp Gly
              60              65              70              75

acg ctc agc tcc tgc ctc cgc ttt gcc tat ccc cag gct ctc ccc aac      292
Thr Leu Ser Ser Cys Leu Arg Phe Ala Tyr Pro Gln Ala Leu Pro Asn
              80              85              90

acc acg ttg ggg gaa gaa agg cag agc cgt ggg gag ctg gag gat gaa      340
Thr Thr Leu Gly Glu Glu Arg Gln Ser Arg Gly Glu Leu Glu Asp Glu
              95              100              105

cct gcc aca gtg ccc tgc tct cag ggc tgg gag tac gac cac tca gaa      388
Pro Ala Thr Val Pro Cys Ser Gln Gly Trp Glu Tyr Asp His Ser Glu
              110              115              120

ttc tcc tct acc att gca act gag tcc cag gtc ggt att tac ata atc      436
Phe Ser Ser Thr Ile Ala Thr Glu Ser Gln Val Gly Ile Tyr Ile Ile
              125              130              135

cat ctg gag gtg gaa tgt cgg tgg agg cag tct ccc tgg gag gca gca      484
His Leu Glu Val Glu Cys Arg Trp Arg Gln Ser Pro Trp Glu Ala Ala
              140              145              150              155

ggt cga ggc ctt cct tgg gaa gaa gct gag gct gca gga ctg ggg agg      532
Gly Arg Gly Leu Pro Trp Glu Glu Ala Glu Ala Ala Gly Leu Gly Arg
              160              165              170

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95/233

gac aaa gtt tcc tat tcc cca agc tgg cgt gaa tcg ttg gga ggt tta	580
Asp Lys Val Ser Tyr Ser Pro Ser Trp Arg Glu Ser Leu Gly Gly Leu	
175 180 185	
tta tct ggc atg gag tgg gat ctg gtg tgt gag cag aaa ggt ctg aac	628
Leu Ser Gly Met Glu Trp Asp Leu Val Cys Glu Gln Lys Gly Leu Asn	
190 195 200	
aga gct gcg tcc act ttc ttc ttc gcc ggt gtg ctg gtg ggg gct gtg	676
Arg Ala Ala Ser Thr Phe Phe Phe Ala Gly Val Leu Val Gly Ala Val	
205 210 215	
gcc ttt gga tat ctg tcc gac agg ttt ggg cgg cgg cgt ctg ctg ctg	724
Ala Phe Gly Tyr Leu Ser Asp Arg Phe Gly Arg Arg Arg Leu Leu Leu	
220 225 230 235	
gta gcc tac gtg agt acc ctg gtg ctg ggc ctg gca tct gca gcc tcc	772
Val Ala Tyr Val Ser Thr Leu Val Leu Gly Leu Ala Ser Ala Ala Ser	
240 245 250	
gtc agc tat gta atg ttt gcc atc acc cgc acc ctt act ggc tca gcc	820
Val Ser Tyr Val Met Phe Ala Ile Thr Arg Thr Leu Thr Gly Ser Ala	
255 260 265	
ctg gct ggt ttt acc atc atc gtg atg cca ctg gag ctg gag tgg ctg	868
Leu Ala Gly Phe Thr Ile Ile Val Met Pro Leu Glu Leu Glu Trp Leu	
270 275 280	
gat gtg gag cac cgc acc gtg gct gga gtc ctg agc agc acc ttc tgg	916
Asp Val Glu His Arg Thr Val Ala Gly Val Leu Ser Ser Thr Phe Trp	
285 290 295	
aca ggg ggc gtg atg ctg ctg gca ctg gtt ggg tac ctg ata cgg gac	964
Thr Gly Gly Val Met Leu Leu Ala Leu Val Gly Tyr Leu Ile Arg Asp	
300 305 310 315	
tgg cga tgg ctt ctg cta gct gtc acc ctg cct tgt gcc cca ggc atc	1012
Trp Arg Trp Leu Leu Leu Ala Val Thr Leu Pro Cys Ala Pro Gly Ile	
320 325 330	
ctc agc ctc tgg tgg gtg cct gag tct gca cgc tgg ctt ctg acc caa	1060
Leu Ser Leu Trp Trp Val Pro Glu Ser Ala Arg Trp Leu Leu Thr Gln	
335 340 345	
ggc cat gtg aaa gag gcc cac agg tac ttg ctc cac tgt gcc agg ctc	1108
Gly His Val Lys Glu Ala His Arg Tyr Leu Leu His Cys Ala Arg Leu	

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350	355	360	
aat ggg cgg cca gtg tgt gag gac agc ttc agc cag gag gct gtg agc			1156
Asn Gly Arg Pro Val Cys Glu Asp Ser Phe Ser Gln Glu Ala Val Ser			
365	370	375	
aaa gtg gcc gcc ggg gaa cgg gtg gtc cga aga cct tca tac cta gac			1204
Lys Val Ala Ala Gly Glu Arg Val Val Arg Arg Pro Ser Tyr Leu Asp			
380	385	390	395
ctg ttc cgc aca cca cgg ctc cga cac atc tca ctg tgc tgc gtg gtg			1252
Leu Phe Arg Thr Pro Arg Leu Arg His Ile Ser Leu Cys Cys Val Val			
400	405	410	
gtg tgg ttc gga gtg aac ttc tcc tat tac ggc ctg agt ctg gat gtg			1300
Val Trp Phe Gly Val Asn Phe Ser Tyr Tyr Gly Leu Ser Leu Asp Val			
415	420	425	
tcg ggg ctg ggg ctg aac gtg tac cag aca cag ctg ttg ttc ggg gct			1348
Ser Gly Leu Gly Leu Asn Val Tyr Gln Thr Gln Leu Leu Phe Gly Ala			
430	435	440	
gtg gaa ctg ccc tcc aag ctg ctg gtc tac ttg tcg gtg cgc tac gca			1396
Val Glu Leu Pro Ser Lys Leu Leu Val Tyr Leu Ser Val Arg Tyr Ala			
445	450	455	
gga cgc cgc ctc acg caa gcc ggg aca ctg ctg ggc acg gcc ctg gcg			1444
Gly Arg Arg Leu Thr Gln Ala Gly Thr Leu Leu Gly Thr Ala Leu Ala			
460	465	470	475
ttc ggc act aga ctg cta gtg tcc tct gat atg aag tcc tgg agc act			1492
Phe Gly Thr Arg Leu Leu Val Ser Ser Asp Met Lys Ser Trp Ser Thr			
480	485	490	
gtc ctg gca gtg atg ggg aaa gct ttt tct gaa gct gcc ttc acc act			1540
Val Leu Ala Val Met Gly Lys Ala Phe Ser Glu Ala Ala Phe Thr Thr			
495	500	505	
gcc tac ctg ttc act tca gag ttg tac cct acg gtg ctc aga cag aca			1588
Ala Tyr Leu Phe Thr Ser Glu Leu Tyr Pro Thr Val Leu Arg Gln Thr			
510	515	520	
ggg atg ggg ctg act gca ctg gtg ggc cgg ctg ggg ggc tct ttg gcc			1636
Gly Met Gly Leu Thr Ala Leu Val Gly Arg Leu Gly Gly Ser Leu Ala			
525	530	535	
cca ctg gcg gcc ttg ctg gat gga gtg tgg ctg tca ctg ccc aag ctt			1684

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Pro Leu Ala Ala Leu Leu Asp Gly Val Trp Leu Ser Leu Pro Lys Leu  
 540                      545                      550                      555  
 act tat ggg ggg atc gcc ctg ctg gct gcc ggc acc gcc ctc ctg ctg      1732  
 Thr Tyr Gly Gly Ile Ala Leu Leu Ala Ala Gly Thr Ala Leu Leu Leu  
                          560                      565                      570  
 cca gag acg agg cag gca cag ctg cca gag acc atc cag gac gtg gag      1780  
 Pro Glu Thr Arg Gln Ala Gln Leu Pro Glu Thr Ile Gln Asp Val Glu  
                          575                      580                      585  
 aga aag agt gcc cca acc agt ctt cag gag gaa gag atg ccc atg aag      1828  
 Arg Lys Ser Ala Pro Thr Ser Leu Gln Glu Glu Glu Met Pro Met Lys  
                          590                      595                      600  
 cag gtc cag aac taagtgggag tggaggcagg cctccacag aagctctgca      1880  
 Gln Val Gln Asn  
                          605  
 gcaggggctg ggagagcaga agggcaggcc ctgcaactca ggctgggagt atcgaaccct      1940  
 ctgcctaggg ccggagttgc tgccagtacc cgtccctctc gtcctccat ccttgattat      2000  
 ttggcttcta ggaacagttg acttcccaga atgcagtggg ctgctgggca cccctctcac      2060  
 ggttggggag gattctgtaa ataaaggtgc cccttgggtt ggggcagtgg tg      2112  
  
 <210> 56  
 <211> 1087  
 <212> DNA  
 <213> Homo sapiens  
 <220>  
 <221> CDS  
 <222> (33)...(977)  
 <400> 56  
 agagggggcg tcaggccgcg ggagaggagg cc atg ggc gcg cgc ggg gcg ctg      53  
    Met Gly Ala Arg Gly Ala Leu  
    1                      5  
 ctg ctg gcg ctg ctg ctg gct cgg gct gga ctc agg aag ccg gag tcg      101  
 Leu Leu Ala Leu Leu Leu Ala Arg Ala Gly Leu Arg Lys Pro Glu Ser  
                          10                      15                      20  
 cag gag gcg gcg ccg tta tca gga cca tgc ggc cga cgg gtc atc acg      149  
 Gln Glu Ala Ala Pro Leu Ser Gly Pro Cys Gly Arg Arg Val Ile Thr

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25	30	35	
tcg cgc atc gtg ggt gga gag gac gcc gaa ctc ggg cgt tgg ccg tgg			197
Ser Arg Ile Val Gly Gly Glu Asp Ala Glu Leu Gly Arg Trp Pro Trp			
40	45	50	55
cag ggg agc ctg cgc ctg tgg gat tcc cac gta tgc gga gtg agc ctg			245
Gln Gly Ser Leu Arg Leu Trp Asp Ser His Val Cys Gly Val Ser Leu			
60	65	70	
ctc agc cac cgc tgg gca ctc acg gcg gcg cac tgc ttt gaa acc tat			293
Leu Ser His Arg Trp Ala Leu Thr Ala Ala His Cys Phe Glu Thr Tyr			
75	80	85	
agt gac ctt agt gat ccc tcc ggg tgg atg gtc cag ttt ggc cag ctg			341
Ser Asp Leu Ser Asp Pro Ser Gly Trp Met Val Gln Phe Gly Gln Leu			
90	95	100	
act tcc atg cca tcc ttc tgg agc ctg cag gcc tac tac acc cgt tac			389
Thr Ser Met Pro Ser Phe Trp Ser Leu Gln Ala Tyr Tyr Thr Arg Tyr			
105	110	115	
ttc gta tcg aat atc tat ctg agc cct cgc tac ctg ggg aat tca ccc			437
Phe Val Ser Asn Ile Tyr Leu Ser Pro Arg Tyr Leu Gly Asn Ser Pro			
120	125	130	135
tat gac att gcc ttg gtg aag ctg tct gca cct gtc acc tac act aaa			485
Tyr Asp Ile Ala Leu Val Lys Leu Ser Ala Pro Val Thr Tyr Thr Lys			
140	145	150	
cac atc cag ccc atc tgt ctc cag gcc tcc aca ttt gag ttt gag aac			533
His Ile Gln Pro Ile Cys Leu Gln Ala Ser Thr Phe Glu Phe Glu Asn			
155	160	165	
ogg aca gac tgc tgg gtg act ggc tgg ggg tac atc aaa gag gat gag			581
Arg Thr Asp Cys Trp Val Thr Gly Trp Gly Tyr Ile Lys Glu Asp Glu			
170	175	180	
gca ctg cca tct ccc cac acc ctc cag gaa gtt cag gtc gcc atc ata			629
Ala Leu Pro Ser Pro His Thr Leu Gln Glu Val Gln Val Ala Ile Ile			
185	190	195	
aac aac tct atg tgc aac cac ctc ttc ctc aag tac agt ttc cgc aag			677
Asn Asn Ser Met Cys Asn His Leu Phe Leu Lys Tyr Ser Phe Arg Lys			
200	205	210	215
gac atc ttt gga gac atg gtt tgt gct ggc aat gcc caa ggc ggg aag			725

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Asp Ile Phe Gly Asp Met Val Cys Ala Gly Asn Ala Gln Gly Gly Lys  
                     220                    225                    230  
 gat gcc tgc ttc ggt gac tca ggt gga ccc ttg gcc tgt aac aag aat 773  
 Asp Ala Cys Phe Gly Asp Ser Gly Gly Pro Leu Ala Cys Asn Lys Asn  
                     235                    240                    245  
 gga ctg tgg tat cag att gga gtc gtg agc tgg gga gtg ggc tgt ggt 821  
 Gly Leu Trp Tyr Gln Ile Gly Val Val Ser Trp Gly Val Gly Cys Gly  
                     250                    255                    260  
 cgg ccc aat cgg ccc ggt gtc tac acc aat atc agc cac cac ttt gag 869  
 Arg Pro Asn Arg Pro Gly Val Tyr Thr Asn Ile Ser His His Phe Glu  
                     265                    270                    275  
 tgg atc cag aag ctg atg gcc cag agt ggc atg tcc cag cca gac ccc 917  
 Trp Ile Gln Lys Leu Met Ala Gln Ser Gly Met Ser Gln Pro Asp Pro  
                     280                    285                    290                    295  
 tcc tgg ccg cta ctc ttt ttc cct ctt ctc tgg gct ctc cca ctc ctg 965  
 Ser Trp Pro Leu Leu Phe Phe Pro Leu Leu Trp Ala Leu Pro Leu Leu  
                     300                    305                    310  
 ggg ccg gtc tgagcctacc tgagcccatg cagcctgggg ccaactgccaa gtcagg 1020  
 Gly Pro Val

ccctggttct cttctgtctt gtttggtaat aaacacattc cagttgatgc cttgcagggc 1080  
 attcttc 1087

&lt;210&gt; 57

&lt;211&gt; 1694

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (216)...(500)

&lt;400&gt; 57

cccgaagttt gaggggtgtg gacggtttgt gacccctta gccgacccta ctctcactg 60  
 gccgggacaa ctggtcttat cacggaggct ggggccaggc agcccttcgg ttcgggtggg 120  
 cccatggacc ccagtccaac gccgagggaa taggaccatc caaaagcgga accttcgcct 180  
 cagaaaaagg cgtggaccct gccagcagcc aggcc atg gag ctc tct gat gtc 233



Met Glu Leu Ser Asp Val

1 5

10 15 20

**25                      30                      35**

**40                      45                      50**

**55                      60                      65                      70**

**75                      80                      85**

90

cactgccacc gctcaccccc agggtcagct gttccaggcc cctcagcctc cttggccccc 640

gtggtgctgt tgggtgtggt ctggtacttc cgaatcaatt accgccaatt cttcacagca 760

tatggacgat aaggacatag gaagaaaata aaaggcatgg tctttctcct ttatggcctc 880

gatggaatc tctccatag gacacaggag gcaagtatgc ggcctccctt tctcatccac 1000

ccttcacttt taggttcctc tgaaggagtt caaagctagt gaccaagctc agtggggagc 1120

gccccagca cccaggctg cctgcaagg caggtcagca tggccccagc acaactccgt 1240

agactggcga gaatgaagat tctggcagc ttctcttata ggcacgtacc ggccttcacc 1360

101/233

gcatttttatt ttattttttt aagagtcctt catagagctc agtcaggaag gggatggggc 1480  
 accaagccaa gccccagca ttgggagcgg ccaggccaca gctgctgctc ccgtagtcct 1540  
 caggctgtaa gcaagagaca gcaactggccc ttggccagcg tcctaccctg cccaactcca 1600  
 aggactgggt atggattgct gggccctagg ctcttgcttc tggggctatt ggagggtcag 1660  
 tgtctgtgac tgaataaagt tccattttgt ggtc 1694

&lt;210&gt; 58

&lt;211&gt; 1522

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (12)...(668)

&lt;400&gt; 58

cctttcccaa g atg gcg tcg aag ata ggt tcg aga cgg tgg atg ttg cag 50  
 Met Ala Ser Lys Ile Gly Ser Arg Arg Trp Met Leu Gln  
 1 5 10  
 ctg atc atg cag ttg ggt tcg gtg ctg etc aca cgc tgc ccc ttt tgg 98  
 Leu Ile Met Gln Leu Gly Ser Val Leu Leu Thr Arg Cys Pro Phe Trp  
 15 20 25  
 ggc tgc ttc agc cag etc atg ctg tac gct gag agg gct gag gca cgc 146  
 Gly Cys Phe Ser Gln Leu Met Leu Tyr Ala Glu Arg Ala Glu Ala Arg  
 30 35 40 45  
 cgg aag ccc gac atc cca gtg cct tac ctg tat ttc gac atg ggg gca 194  
 Arg Lys Pro Asp Ile Pro Val Pro Tyr Leu Tyr Phe Asp Met Gly Ala  
 50 55 60  
 gcc gtg ctg tgc gct agt ttc atg tcc ttt ggc gtg aag cgg cgc tgg 242  
 Ala Val Leu Cys Ala Ser Phe Met Ser Phe Gly Val Lys Arg Arg Trp  
 65 70 75  
 ttc gcg ctg ggg gcc gca etc caa ttg gcc att agc acc tac gcc gcc 290  
 Phe Ala Leu Gly Ala Ala Leu Gln Leu Ala Ile Ser Thr Tyr Ala Ala  
 80 85 90  
 tac atc ggg ggc tac gtc cac tac ggg gac tgg ctg aag gtc cgt atg 338  
 Tyr Ile Gly Gly Tyr Val His Tyr Gly Asp Trp Leu Lys Val Arg Met  
 95 100 105

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tac tcg cgc aca gtt gcc atc atc ggc gga ctt tct tgt gtt ggc cag	386
Tyr Ser Arg Thr Val Ala Ile Ile Gly Gly Leu Ser Cys Val Gly Gln	
110                      115                      120                      125	
cgg tgc tgg gga gct gta ccg ccg gaa acc tcg cag ccg ctc cct gca	434
Arg Cys Trp Gly Ala Val Pro Pro Glu Thr Ser Gln Pro Leu Pro Ala	
130                      135                      140	
gtc cac cgg cca ggt gtt cct ggg tat cta cct cat ctg tgt ggc cta	482
Val His Arg Pro Gly Val Pro Gly Tyr Leu Pro His Leu Cys Gly Leu	
145                      150                      155	
ctc act gca gca cag caa gga gga ccg gct ggc gta tct gaa cca tct	530
Leu Thr Ala Ala Gln Gln Gly Gly Pro Ala Gly Val Ser Glu Pro Ser	
160                      165                      170	
ccc agg agg gga gct gat gat cca gct gtt ctt cgt gct gta tgg cat	578
Pro Arg Arg Gly Ala Asp Asp Pro Ala Val Leu Arg Ala Val Trp His	
175                      180                      185	
cct ggc cct ggc ctt tct gtc agg cta cta cgt gac cct cgc tgc cca	626
Pro Gly Pro Gly Leu Ser Val Arg Leu Leu Arg Asp Pro Arg Cys Pro	
190                      195                      200                      205	
gat cct ggc tgt act gct gcc ccc tgt cat gct gct cat tgatg	670
Asp Pro Gly Cys Thr Ala Ala Pro Cys His Ala Ala His	
210                      215	
gcaatgttgc ttactggcac aacacgcggc gtgttgagtt ctggaaccag atgaagetcc	730
ttggagagag tgtgggcac tcgggaactg ctgtcatctg gccactgatg gctgagtttt	790
atggcaagag gctgagatgg gcacagggag ccaactgaggg tcacctgcc ttctctcttg	850
ctggcccagc tgetgtttat ttatgctttt tgggtctgtt gtttgatctt ttgtcttttt	910
aaaattgttt ttgacagtta agaggcagct cattttgtcca aattttctggg ctccagcgtt	970
gggagggcag gagccctggc actaatgctg tacaggtttt ttctctgtta ggagagctga	1030
ggccagctgc ccactgagtc tcctgtccct gagaaggagg tatggcaggg ctgggatgag	1090
gctactgaga gtgggagagt gggagacaga ggaagggaaga tggagattgg aagtgagcaa	1150
atgtgaaaaa ttctctcttg aacctggcag atgcagctag gctctgcagt gctgtttgga	1210
gactgtgaga gggagtgcgt gtgttgacac atgtggatca ggcccaggaa gggcacaggg	1270
gctgagcact acagaagtca catgggttct caggggtatgc caggggcaga aacagtaccg	1330
gctctctgtc actcaccttg agagtagagc agacctgtt ctgctctggg ctgtgaaggg	1390
gtggagcagg cagtggccag ctttgccctt cctgctgtct ctgtttctag ctccatgggt	1450
ggcctgggtgg ggggtggagt ccctcccaaa caccagacca cacagtctc caaaaataaa	1510

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cattttatat ag

1522

&lt;210&gt; 59

&lt;211&gt; 1591

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (44)...(1426)

&lt;400&gt; 59

gaaaacagtt ccacgttgct tgaaattgaa aatcaagata aaa atg ttc aca att 55

Met Phe Thr Ile

1

aag ctc ctt ctt ttt att gtt cct cta gtt att tcc tcc aga att gat 103

Lys Leu Leu Leu Phe Ile Val Pro Leu Val Ile Ser Ser Arg Ile Asp

5

10

15

20

caa gac aat tca tca ttt gat tct cta tct cca gag cca aaa tca aga 151

Gln Asp Asn Ser Ser Phe Asp Ser Leu Ser Pro Glu Pro Lys Ser Arg

25

30

35

ttt gct atg tta gac gat gta aaa att tta gcc aat ggc ctc ctt cag 199

Phe Ala Met Leu Asp Asp Val Lys Ile Leu Ala Asn Gly Leu Leu Gln

40

45

50

ttg gga cat ggt ctt aaa gac ttt gtc cat aag acg aag ggc caa att 247

Leu Gly His Gly Leu Lys Asp Phe Val His Lys Thr Lys Gly Gln Ile

55

60

65

aat gac ata ttt caa aaa ctc aac ata ttt gat cag tct ttt tat gat 295

Asn Asp Ile Phe Gln Lys Leu Asn Ile Phe Asp Gln Ser Phe Tyr Asp

70

75

80

cta tcg ctg caa acc agt gaa atc aaa gaa gaa gaa aag gaa ctg aga 343

Leu Ser Leu Gln Thr Ser Glu Ile Lys Glu Glu Glu Lys Glu Leu Arg

85

90

95

100

aga act aca tat aaa cta caa gtc aaa aat gaa gag gta aag aat atg 391

Arg Thr Thr Tyr Lys Leu Gln Val Lys Asn Glu Glu Val Lys Asn Met

105

110

115

tca ctt gaa ctc aac tca aaa ctt gaa agc ctc cta gaa gaa aaa att 439

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Ser Leu Glu Leu Asn Ser Lys Leu Glu Ser Leu Leu Glu Glu Lys Ile	
120 125 130	
cta ctt caa caa aaa gtg aaa tat tta gaa gag caa cta act aac tta	487
Leu Leu Gln Gln Lys Val Lys Tyr Leu Glu Glu Gln Leu Thr Asn Leu	
135 140 145	
att caa aat caa cct gaa act cca gaa cac cca gaa gta act tca ctt	535
Ile Gln Asn Gln Pro Glu Thr Pro Glu His Pro Glu Val Thr Ser Leu	
150 155 160	
aaa act ttt gta gaa aaa caa gat aat agc atc aaa gac ctt ctc cag	583
Lys Thr Phe Val Glu Lys Gln Asp Asn Ser Ile Lys Asp Leu Leu Gln	
165 170 175 180	
acc gtg gaa gac caa tat aaa caa tta aac caa cag cat agt caa ata	631
Thr Val Glu Asp Gln Tyr Lys Gln Leu Asn Gln Gln His Ser Gln Ile	
185 190 195	
aaa gaa ata gaa aat cag ctc aga agg act agt att caa gaa ccc aca	679
Lys Glu Ile Glu Asn Gln Leu Arg Arg Thr Ser Ile Gln Glu Pro Thr	
200 205 210	
gaa att tct cta tct tcc aag cca aga gca cca aga act act ccc ttt	727
Glu Ile Ser Leu Ser Ser Lys Pro Arg Ala Pro Arg Thr Thr Pro Phe	
215 220 225	
ctt cag ttg aat gaa ata aga aat gta aaa cat gat ggc att cct gct	775
Leu Gln Leu Asn Glu Ile Arg Asn Val Lys His Asp Gly Ile Pro Ala	
230 235 240	
gaa tgt acc acc att tat aac aga ggt gaa cat aca agt ggc atg tat	823
Glu Cys Thr Thr Ile Tyr Asn Arg Gly Glu His Thr Ser Gly Met Tyr	
245 250 255 260	
gcc atc aga ccc agc aac tct caa gtt ttt cat gtc tac tgt gat gtt	871
Ala Ile Arg Pro Ser Asn Ser Gln Val Phe His Val Tyr Cys Asp Val	
265 270 275	
ata tca ggt agt cca tgg aca tta att caa cat cga ata gat gga tca	919
Ile Ser Gly Ser Pro Trp Thr Leu Ile Gln His Arg Ile Asp Gly Ser	
280 285 290	
caa aac ttc aat gaa acg tgg gag aac tac aaa tat ggt ttt ggg agg	967
Gln Asn Phe Asn Glu Thr Trp Glu Asn Tyr Lys Tyr Gly Phe Gly Arg	
295 300 305	

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ctt gat gga gaa ttt tgg ttg ggc cta gag aag ata tac tcc ata gtg	1015
Leu Asp Gly Glu Phe Trp Leu Gly Leu Glu Lys Ile Tyr Ser Ile Val	
310 315 320	
aag caa tct aat tat gtt tta cga att gag ctg gaa gac tgg aaa gac	1063
Lys Gln Ser Asn Tyr Val Leu Arg Ile Glu Leu Glu Asp Trp Lys Asp	
325 330 335 340	
aac aaa cat tat att gaa tat tct ttt tac ttg gga aat cac gaa acc	1111
Asn Lys His Tyr Ile Glu Tyr Ser Phe Tyr Leu Gly Asn His Glu Thr	
345 350 355	
aac tat acg cta cat cta gtt gcg att act ggc aat gtc ccc aat gca	1159
Asn Tyr Thr Leu His Leu Val Ala Ile Thr Gly Asn Val Pro Asn Ala	
360 365 370	
atc ccg gaa aac aaa gat ttg gtg ttt tct act tgg gat cac aaa gca	1207
Ile Pro Glu Asn Lys Asp Leu Val Phe Ser Thr Trp Asp His Lys Ala	
375 380 385	
aaa gga cac ttc aac tgt cca gag ggt tat tca gga ggc tgg tgg tgg	1255
Lys Gly His Phe Asn Cys Pro Glu Gly Tyr Ser Gly Gly Trp Trp Trp	
390 395 400	
cat gat gag tgt gga gaa aac aac cta aat ggt aaa tat aac aaa cca	1303
His Asp Glu Cys Gly Glu Asn Asn Leu Asn Gly Lys Tyr Asn Lys Pro	
405 410 415 420	
aga gca aaa tct aag cca gag agg aga aga gga tta tct tgg aag tct	1351
Arg Ala Lys Ser Lys Pro Glu Arg Arg Arg Gly Leu Ser Trp Lys Ser	
425 430 435	
caa aat gga agg tta tac tct ata aaa tca acc aaa atg ttg atc cat	1399
Gln Asn Gly Arg Leu Tyr Ser Ile Lys Ser Thr Lys Met Leu Ile His	
440 445 450	
cca aca gat tca gaa agc ttt gaa tgaactgagg caaatttaaa aggcaat	1450
Pro Thr Asp Ser Glu Ser Phe Glu	
455 460	
aattttaaca ttaacotcat tccaagttaa tgtggtctaa taatctggta ttaaatectt	1510
aagagaaagc ttgagaaata gatttttttt tatcttaaag tcaactgtcta ttttaagatta	1570
aacatacaat cacataacct t	1591

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&lt;211&gt; 1249

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (134)...(784)

&lt;400&gt; 60

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aacagtctgt ggagacagtt gtgtccctgt ggctttggtg cgctgtgtg cactttctcc      60
ctccacctgg agcatgggct aacaccggag gaaaggaaaa gacagagtca gacagggagc      120
ctggggaggg gcc atg gtg cca atg cac tta ctg ggg aga ctg gag aag      169
      Met Val Pro Met His Leu Leu Gly Arg Leu Glu Lys
              1              5              10
ccg ctt ctc ctc ctg tgc tgc gcc tcc ttc cta ctg ggg ctg gct ttg      217
Pro Leu Leu Leu Leu Cys Cys Ala Ser Phe Leu Leu Gly Leu Ala Leu
              15              20              25
ctg ggc ata aag acg gac atc acc ccc gtt gct tat ttc ttt ctc aca      265
Leu Gly Ile Lys Thr Asp Ile Thr Pro Val Ala Tyr Phe Phe Leu Thr
              30              35              40
ttg ggt ggc ttc ttc ttg ttt gcc tat ctc ctg gtc cgg ttt ctg gaa      313
Leu Gly Gly Phe Phe Leu Phe Ala Tyr Leu Leu Val Arg Phe Leu Glu
              45              50              55              60
tgg ggg ctt cgg tcc cag ctc caa tca atg cag act gag agc cca ggg      361
Trp Gly Leu Arg Ser Gln Leu Gln Ser Met Gln Thr Glu Ser Pro Gly
              65              70              75
ccc tca ggc aat gca cgg gac aat gaa gcc ttt gaa gtg cca gtc tat      409
Pro Ser Gly Asn Ala Arg Asp Asn Glu Ala Phe Glu Val Pro Val Tyr
              80              85              90
gaa gag gcc gtg gtg gga cta gaa tcc cag tgc cgc ccc caa gag ttg      457
Glu Glu Ala Val Val Gly Leu Glu Ser Gln Cys Arg Pro Gln Glu Leu
              95              100              105
gac caa cca ccc ccc tac agc act gtt gtg ata ccc cca gca cct gag      505
Asp Gln Pro Pro Pro Tyr Ser Thr Val Val Ile Pro Pro Ala Pro Glu
              110              115              120
gag gaa caa cct agc cat cca gag ggg tcc agg aga gcc aaa ctg gaa      553
Glu Glu Gln Pro Ser His Pro Glu Gly Ser Arg Arg Ala Lys Leu Glu

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125	130	135	140	
cag agg cga atg gcc tca gag ggg tcc atg gcc cag gaa gga agc cct				601
Gln Arg Arg Met Ala Ser Glu Gly Ser Met Ala Gln Glu Gly Ser Pro				
	145	150	155	
gga aga gct cca atc aac ctt cgg ctt cgg gga cca cgg gct gtg tcc				649
Gly Arg Ala Pro Ile Asn Leu Arg Leu Arg Gly Pro Arg Ala Val Ser				
	160	165	170	
act gct cct gat ctg cag agc ttg gcg gca gtc ccc aca tta gag cct				697
Thr Ala Pro Asp Leu Gln Ser Leu Ala Ala Val Pro Thr Leu Glu Pro				
	175	180	185	
ctg act cca ccc cct gcc tat gat gtc tgc ttt ggt cac cct gat gat				745
Leu Thr Pro Pro Pro Ala Tyr Asp Val Cys Phe Gly His Pro Asp Asp				
	190	195	200	
gat agt gtt ttt tat gag gac aac tgg gca ccc cct taaatgact				790
Asp Ser Val Phe Tyr Glu Asp Asn Trp Ala Pro Pro				
205	210	215		
ctcccaagat ttctcttctc tccacaccag acctcggttca tttgactaac attttccagc				850
gcctactatg tgtcagaaac aagtgtttct gcctggacat cataaatggg gacttggacc				910
ctgaggagag tcaggccacg gtaagccctt cccagctgag atatgggtgg cataatttga				970
gtctctctggc aacatttggg gacctacccc atatccaata tttccagcgt tagattgagg				1030
atgaggtagg gaggtgatcc agagaaggcg gagaaggaag aagtaacctc tgagtggcgg				1090
ctattgcttc tggtccagggt gctgttcgag ctgttagaac ccttaggctt gacagctttg				1150
tgagttatta ttgaaaaatg aggattccaa gagtcagagg agtttgataa tgtgcacgag				1210
ggcacactgc tagtaaataa cattaaaata actggaatg				1249

&lt;210&gt; 61

&lt;211&gt; 392

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 61

Met	Glu	Gly	Val	Ser	Ala	Leu	Leu	Ala	Arg	Cys	Pro	Thr	Ala	Gly	Leu
1					5				10				15		
Ala	Gly	Gly	Leu	Gly	Val	Thr	Ala	Cys	Ala	Ala	Ala	Gly	Val	Leu	Leu
			20					25				30			
Tyr	Arg	Ile	Ala	Arg	Arg	Met	Lys	Pro	Thr	His	Thr	Met	Val	Asn	Cys



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35	40	45
Trp Phe Cys Asn Gln Asp Thr Leu Val Pro Tyr Gly Asn Arg Asn Cys		
50	55	60
Trp Asp Cys Pro His Cys Glu Gln Tyr Asn Gly Phe Gln Glu Asn Gly		
65	70	75
Asp Tyr Asn Lys Pro Ile Pro Ala Gln Tyr Leu Glu His Leu Asn His		
85	90	95
Val Val Ser Ser Ala Pro Ser Leu Arg Asp Pro Ser Gln Pro Gln Gln		
100	105	110
Trp Val Ser Ser Gln Val Leu Leu Cys Lys Arg Cys Asn His His Gln		
115	120	125
Thr Thr Lys Ile Lys Gln Leu Ala Ala Phe Ala Pro Arg Glu Glu Gly		
130	135	140
Arg Tyr Asp Glu Glu Val Glu Val Tyr Arg His His Leu Glu Gln Met		
145	150	155
Tyr Lys Leu Cys Arg Pro Cys Gln Ala Ala Val Glu Tyr Tyr Ile Lys		
165	170	175
His Gln Asn Arg Gln Leu Arg Ala Leu Leu Leu Ser His Gln Phe Lys		
180	185	190
Arg Arg Glu Ala Asp Gln Thr His Ala Gln Asn Phe Ser Ser Ala Val		
195	200	205
Lys Ser Pro Val Gln Val Ile Leu Leu Arg Ala Leu Ala Phe Leu Ala		
210	215	220
Cys Ala Phe Leu Leu Thr Thr Ala Leu Tyr Gly Ala Ser Gly His Phe		
225	230	235
Ala Pro Gly Thr Thr Val Pro Leu Ala Leu Pro Pro Gly Gly Asn Gly		
245	250	255
Ser Ala Thr Pro Asp Asn Gly Thr Thr Pro Gly Ala Glu Gly Trp Arg		
260	265	270
Gln Leu Leu Gly Leu Leu Pro Glu His Met Ala Glu Lys Leu Cys Glu		
275	280	285
Ala Trp Ala Phe Gly Gln Ser His Gln Thr Gly Val Val Ala Leu Gly		
290	295	300
Leu Leu Thr Cys Leu Leu Ala Met Leu Leu Ala Gly Arg Ile Arg Leu		
305	310	315
		320

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Arg Arg Ile Asp Ala Phe Cys Thr Cys Leu Trp Ala Leu Leu Leu Gly  
                             325                            330                            335  
 Leu His Leu Ala Glu Gln His Leu Gln Ala Ala Ser Pro Ser Trp Leu  
                             340                            345                            350  
 Asp Thr Leu Lys Phe Ser Thr Thr Ser Leu Cys Cys Leu Val Gly Phe  
                             355                            360                            365  
 Thr Ala Ala Val Ala Thr Arg Lys Ala Thr Gly Pro Arg Arg Phe Arg  
                             370                            375                            380  
 Pro Arg Arg Ser Glu Lys Gln Pro  
 385                            390

&lt;210&gt; 62

&lt;211&gt; 497

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 62

Met Ala Leu Trp Arg Gly Ser Ala Tyr Ala Gly Phe Leu Ala Leu Ala  
   1                            5                            10                            15  
 Val Gly Cys Val Phe Leu Leu Glu Pro Glu Leu Pro Gly Ser Ala Leu  
                             20                            25                            30  
 Arg Ser Leu Trp Ser Ser Leu Cys Leu Gly Pro Ala Pro Ala Pro Pro  
                             35                            40                            45  
 Gly Pro Val Ser Pro Glu Gly Arg Leu Ala Ala Ala Trp Asp Ala Leu  
                             50                            55                            60  
 Ile Val Arg Pro Val Arg Arg Trp Arg Arg Val Ala Val Gly Val Asn  
   65                            70                            75                            80  
 Ala Cys Val Asp Val Val Leu Ser Gly Val Lys Leu Leu Gln Ala Leu  
                             85                            90                            95  
 Gly Leu Ser Pro Gly Asn Gly Lys Asp His Ser Ile Leu His Ser Arg  
                             100                            105                            110  
 Asn Asp Leu Glu Glu Ala Phe Ile His Phe Met Trp Lys Gly Ala Ala  
                             115                            120                            125  
 Ala Glu Arg Phe Phe Ser Asp Lys Glu Thr Phe His Asp Ile Ala Gln  
                             130                            135                            140  
 Val Ala Ser Glu Phe Pro Gly Ala Gln His Tyr Val Gly Gly Asn Ala

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145	150	155	160
Ala Leu Ile Gly Gln Lys Phe Ala Ala Asn Ser Asp Leu Lys Val Leu			
165	170	175	
Leu Cys Gly Pro Val Gly Pro Arg Leu His Glu Leu Leu Asp Asp Asn			
180	185	190	
Val Phe Val Pro Pro Glu Ser Leu Gln Glu Val Asp Glu Phe His Leu			
195	200	205	
Ile Leu Glu Tyr Gln Ala Gly Glu Glu Trp Gly Gln Leu Lys Ala Pro			
210	215	220	
His Ala Asn Arg Phe Ile Phe Ser His Asp Leu Ser Asn Gly Ala Met			
225	230	235	240
Asn Met Leu Glu Val Phe Val Ser Ser Leu Glu Glu Phe Gln Pro Asp			
245	250	255	
Leu Val Val Leu Ser Gly Leu His Met Met Glu Gly Gln Ser Lys Glu			
260	265	270	
Leu Gln Arg Lys Arg Leu Leu Glu Val Val Thr Ser Ile Ser Asp Ile			
275	280	285	
Pro Thr Gly Ile Pro Val His Leu Glu Leu Ala Ser Met Thr Asn Arg			
290	295	300	
Glu Leu Met Ser Ser Ile Val His Gln Gln Val Phe Pro Ala Val Thr			
305	310	315	320
Ser Leu Gly Leu Asn Glu Gln Glu Leu Leu Phe Leu Thr Gln Ser Ala			
325	330	335	
Ser Gly Pro His Ser Ser Leu Ser Ser Trp Asn Gly Val Pro Asp Val			
340	345	350	
Gly Met Val Ser Asp Ile Leu Phe Trp Ile Leu Lys Glu His Gly Arg			
355	360	365	
Ser Lys Ser Arg Ala Ser Asp Leu Thr Arg Ile His Phe His Thr Leu			
370	375	380	
Val Tyr His Ile Leu Ala Thr Val Asp Gly His Trp Ala Asn Gln Leu			
385	390	395	400
Ala Ala Val Ala Ala Gly Ala Arg Val Ala Gly Thr Gln Ala Cys Ala			
405	410	415	
Thr Glu Thr Ile Asp Thr Ser Arg Val Ser Leu Arg Ala Pro Gln Glu			
420	425	430	

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Ph Met Thr Ser His Ser Glu Ala Gly Ser Arg Ile Val Leu Asn Pro  
 435 440 445  
 Asn Lys Pro Val Val Glu Trp His Arg Glu Gly Ile Ser Phe His Phe  
 450 455 460  
 Thr Pro Val Leu Val Cys Lys Asp Pro Ile Arg Thr Val Gly Leu Gly  
 465 470 475 480  
 Asp Ala Ile Ser Ala Glu Gly Leu Phe Tyr Ser Glu Val His Pro His  
 485 490 495  
 Tyr

&lt;210&gt; 63

&lt;211&gt; 417

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 63

Met Leu Val His Leu Phe Arg Val Gly Ile Arg Gly Gly Pro Phe Pro  
 1 5 10 15  
 Gly Arg Leu Leu Pro Pro Leu Arg Phe Gln Thr Phe Ser Ala Val Arg  
 20 25 30  
 Tyr Ser Asp Gly Tyr Arg Ser Ser Ser Leu Leu Arg Ala Val Ala His  
 35 40 45  
 Leu Arg Ser Gln Leu Trp Ala His Leu Pro Arg Ala Pro Leu Ala Pro  
 50 55 60  
 Arg Trp Ser Pro Ser Ala Trp Cys Trp Val Gly Gly Ala Leu Leu Gly  
 65 70 75 80  
 Pro Met Val Leu Ser Lys His Pro His Leu Cys Leu Val Ala Leu Cys  
 85 90 95  
 Glu Ala Glu Glu Ala Pro Pro Ala Ser Ser Thr Pro His Val Val Gly  
 100 105 110  
 Ser Arg Phe Asn Trp Lys Leu Phe Trp Gln Phe Leu His Pro His Leu  
 115 120 125  
 Leu Val Leu Gly Val Ala Val Val Leu Ala Leu Gly Ala Ala Leu Val  
 130 135 140  
 Asn Val Gln Ile Pro Leu Leu Leu Gly Gln Leu Val Glu Val Val Ala  
 145 150 155 160

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Lys Tyr Thr Arg Asp His Val Gly Ser Phe Met Thr Glu Ser Gln Asn  
 165 170 175  
 Leu Ser Thr His Leu Leu Ile Leu Tyr Gly Val Gln Gly Leu Leu Thr  
 180 185 190  
 Phe Gly Tyr Leu Val Leu Leu Ser His Val Gly Glu Arg Met Ala Val  
 195 200 205  
 Asp Met Arg Arg Ala Leu Phe Ser Ser Leu Leu Arg Tyr Cys Gln Pro  
 210 215 220  
 Gln Gly Ala Glu Leu Gly Gln Asp Ile Thr Phe Phe Asp Ala Asn Lys  
 225 230 235 240  
 Thr Gly Gln Leu Val Ser Arg Leu Thr Thr Asp Val Gln Glu Phe Lys  
 245 250 255  
 Ser Ser Phe Lys Leu Val Ile Ser Gln Gly Leu Arg Ser Cys Thr Gln  
 260 265 270  
 Val Ala Gly Cys Leu Val Ser Leu Ser Met Leu Ser Thr Arg Leu Thr  
 275 280 285  
 Leu Leu Leu Met Val Ala Thr Pro Ala Leu Met Gly Val Gly Thr Leu  
 290 295 300  
 Met Gly Ser Gly Leu Arg Lys Leu Ser Cys Gln Cys Gln Glu Gln Ile  
 305 310 315 320  
 Ala Arg Ala Met Gly Val Ala Asp Glu Ala Leu Gly Asn Val Arg Thr  
 325 330 335  
 Val Arg Ala Phe Ala Met Glu Gln Arg Glu Glu Glu Arg Tyr Gly Ala  
 340 345 350  
 Glu Leu Glu Ala Cys Arg Cys Arg Ala Glu Glu Leu Gly Arg Gly Ile  
 355 360 365  
 Ala Leu Phe Gln Gly Leu Ser Asn Ile Ala Phe Asn Cys Met Val Leu  
 370 375 380  
 Gly Thr Leu Phe Ile Gly Gly Ser Leu Val Ala Gly Gln Gln Leu Thr  
 385 390 395 400  
 Gly Gly Asp Leu Met Ser Phe Leu Val Ala Ser Gln Thr Val Gln Arg  
 405 410 415  
 Leu

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&lt;211&gt; 649

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 64

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Met Ile Pro Asn Gln His Asn Ala Gly Ala Gly Ser His Gln Pro Ala
  1             5             10             15
Val Phe Arg Met Ala Val Leu Asp Thr Asp Leu Asp His Ile Leu Pro
          20             25             30
Ser Ser Val Leu Pro Pro Phe Trp Ala Lys Leu Val Val Gly Ser Val
          35             40             45
Ala Ile Val Cys Phe Ala Arg Ser Tyr Asp Gly Asp Phe Val Phe Asp
          50             55             60
Asp Ser Glu Ala Ile Val Asn Asn Lys Val Ala Gly Val Val Gly Arg
          65             70             75             80
Ala Asp Leu Leu Cys Ala Leu Phe Phe Leu Leu Ser Phe Leu Gly Tyr
          85             90             95
Cys Lys Ala Phe Arg Glu Ser Asn Lys Glu Gly Ala His Ser Ser Thr
          100            105            110
Phe Trp Val Leu Leu Ser Ile Phe Leu Gly Ala Val Ala Met Leu Cys
          115            120            125
Lys Glu Gln Gly Ile Thr Val Leu Gly Leu Asn Ala Val Phe Asp Ile
          130            135            140
Leu Val Ile Gly Lys Phe Asn Val Leu Glu Ile Val Gln Lys Val Leu
          145            150            155            160
His Lys Asp Lys Ser Leu Glu Asn Leu Gly Met Leu Arg Asn Gly Gly
          165            170            175
Leu Leu Phe Arg Met Thr Leu Leu Thr Ser Gly Gly Ala Gly Met Leu
          180            185            190
Tyr Val Arg Trp Arg Ile Met Gly Thr Gly Pro Pro Ala Phe Thr Glu
          195            200            205
Val Asp Asn Pro Ala Ser Phe Ala Asp Ser Met Leu Val Arg Ala Val
          210            215            220
Asn Tyr Asn Tyr Tyr Tyr Ser Leu Asn Ala Trp Leu Leu Leu Cys Pro
          225            230            235            240
Trp Trp Leu Cys Phe Asp Trp Ser Met Gly Cys Ile Pro Leu Ile Lys

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245	250	255
Ser Ile Ser Asp Trp Arg Val Ile Ala Leu Ala Ala Leu Trp Phe Cys		
260	265	270
Leu Ile Gly Leu Ile Cys Gln Ala Leu Cys Ser Glu Asp Gly His Lys		
275	280	285
Arg Arg Ile Leu Thr Leu Gly Leu Gly Phe Leu Val Ile Pro Phe Leu		
290	295	300
Pro Ala Ser Asn Leu Phe Phe Arg Val Gly Phe Val Val Ala Glu Arg		
305	310	315
Val Leu Tyr Leu Pro Ser Ile Gly Tyr Cys Val Leu Leu Thr Phe Gly		
325	330	335
Phe Gly Ala Leu Ser Lys His Thr Lys Lys Lys Lys Leu Ile Ala Ala		
340	345	350
Val Val Leu Gly Ile Leu Phe Ile Asn Thr Leu Arg Cys Val Leu Arg		
355	360	365
Ser Gly Glu Trp Arg Ser Glu Glu Gln Leu Phe Arg Ser Ala Leu Ser		
370	375	380
Val Cys Pro Leu Asn Ala Lys Val His Tyr Asn Ile Gly Lys Asn Leu		
385	390	395
Ala Asp Lys Gly Asn Gln Thr Ala Ala Ile Arg Tyr Tyr Arg Glu Ala		
405	410	415
Val Arg Leu Asn Pro Lys Tyr Val His Ala Met Asn Asn Leu Gly Asn		
420	425	430
Ile Leu Lys Glu Arg Asn Glu Leu Gln Glu Ala Glu Glu Leu Leu Ser		
435	440	445
Leu Ala Val Gln Ile Gln Pro Asp Phe Ala Ala Ala Trp Met Asn Leu		
450	455	460
Gly Ile Val Gln Asn Ser Leu Lys Arg Phe Glu Ala Ala Glu Gln Ser		
465	470	475
Tyr Arg Thr Ala Ile Lys His Arg Arg Lys Tyr Pro Asp Cys Tyr Tyr		
485	490	495
Asn Leu Gly Arg Leu Tyr Ala Asp Leu Asn Arg His Val Asp Ala Leu		
500	505	510
Asn Ala Trp Arg Asn Ala Thr Val Leu Lys Pro Glu His Ser Leu Ala		
515	520	525

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Trp Asn Asn Met Ile Ile Leu Leu Asp Asn Thr Gly Asn Leu Ala Gln  
 530 535 540  
 Ala Glu Ala Val Gly Arg Glu Ala Leu Glu Leu Ile Pro Asn Asp His  
 545 550 555 560  
 Ser Leu Met Phe Ser Leu Ala Asn Val Leu Gly Lys Ser Gln Lys Tyr  
 565 570 575  
 Lys Glu Ser Glu Ala Leu Phe Leu Lys Ala Ile Lys Ala Asn Pro Asn  
 580 585 590  
 Ala Ala Ser Tyr His Gly Asn Leu Ala Val Leu Tyr His Arg Trp Gly  
 595 600 605  
 His Leu Asp Leu Ala Lys Lys His Tyr Glu Ile Ser Leu Gln Leu Asp  
 610 615 620  
 Pro Thr Ala Ser Gly Thr Lys Glu Asn Tyr Gly Leu Leu Arg Arg Lys  
 625 630 635 640  
 Leu Glu Leu Met Gln Lys Lys Ala Val  
 645

&lt;210&gt; 65

&lt;211&gt; 93

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 65

Met Ile His Leu Gly His Ile Leu Phe Leu Leu Leu Leu Pro Val Ala  
 1 5 10 15  
 Ala Ala Gln Thr Thr Pro Gly Glu Arg Ser Ser Leu Pro Ala Phe Tyr  
 20 25 30  
 Pro Gly Thr Ser Gly Ser Cys Ser Gly Cys Gly Ser Leu Ser Leu Pro  
 35 40 45  
 Leu Leu Ala Gly Leu Val Ala Ala Asp Ala Val Ala Ser Leu Leu Ile  
 50 55 60  
 Val Gly Ala Val Phe Leu Cys Ala Arg Pro Arg Arg Ser Pro Ala Gln  
 65 70 75 80  
 Glu Asp Gly Lys Val Tyr Ile Asn Met Pro Gly Arg Gly  
 85 90



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&lt;210&gt; 66

&lt;211&gt; 425

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 66

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Met Gly Ser Trp Ala Ala Val Asn Gly Ile Trp Val Glu Leu Pro Val
  1             5             10             15
Val Val Lys Glu Leu Pro Glu Gly Trp Ser Leu Pro Ser Tyr Val Ser
      20             25             30
Val Leu Val Ala Leu Gly Asn Leu Gly Leu Leu Val Val Thr Leu Trp
      35             40             45
Arg Arg Leu Ala Pro Gly Lys Asp Glu Gln Val Pro Ile Arg Val Val
      50             55             60
Gln Val Leu Gly Met Val Gly Thr Ala Leu Leu Ala Ser Leu Trp His
      65             70             75             80
His Val Ala Pro Val Ala Gly Gln Leu His Ser Val Ala Phe Leu Ala
      85             90             95
Leu Ala Phe Val Leu Ala Leu Ala Cys Cys Ala Ser Asn Val Thr Phe
      100            105            110
Leu Pro Phe Leu Ser His Leu Pro Pro Arg Phe Leu Arg Ser Phe Phe
      115            120            125
Leu Gly Gln Gly Leu Ser Ala Leu Leu Pro Cys Val Leu Ala Leu Val
      130            135            140
Gln Gly Val Gly Arg Leu Glu Cys Pro Pro Ala Pro Ile Asn Gly Thr
      145            150            155            160
Pro Gly Pro Pro Leu Asp Phe Leu Glu Arg Phe Pro Ala Ser Thr Phe
      165            170            175
Phe Trp Ala Leu Thr Ala Leu Leu Val Ala Ser Ala Ala Ala Phe Gln
      180            185            190
Gly Leu Leu Leu Leu Leu Pro Pro Pro Pro Ser Val Pro Thr Gly Glu
      195            200            205
Leu Gly Ser Gly Leu Gln Val Gly Ala Pro Gly Ala Glu Glu Glu Val
      210            215            220
Glu Glu Ser Ser Pro Leu Gln Glu Pro Pro Ser Gln Ala Ala Gly Thr
      225            230            235            240

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Thr Pro Gly Pro Asp Pro Lys Ala Tyr Gln Leu Leu Ser Ala Arg Ser  
                             245                            250                            255  
 Ala Cys Leu Leu Gly Leu Leu Ala Ala Thr Asn Ala Leu Thr Asn Gly  
                             260                            265                            270  
 Val Leu Pro Ala Val Gln Ser Phe Ser Cys Leu Pro Tyr Gly Arg Leu  
                             275                            280                            285  
 Ala Tyr His Leu Ala Val Val Leu Gly Ser Ala Ala Asn Pro Leu Ala  
                             290                            295                            300  
 Cys Phe Leu Ala Met Gly Val Leu Cys Arg Ser Leu Ala Gly Leu Gly  
 305                            310                            315                            320  
 Gly Leu Ser Leu Leu Gly Val Phe Cys Gly Gly Tyr Leu Met Ala Leu  
                             325                            330                            335  
 Ala Val Leu Ser Pro Cys Pro Pro Leu Val Gly Thr Ser Ala Gly Val  
                             340                            345                            350  
 Val Leu Val Val Leu Ser Trp Val Leu Cys Leu Gly Val Phe Ser Tyr  
                             355                            360                            365  
 Val Lys Val Ala Ala Ser Ser Leu Leu His Gly Gly Gly Arg Pro Ala  
                             370                            375                            380  
 Leu Leu Ala Ala Gly Val Ala Ile Gln Val Gly Ser Leu Leu Gly Ala  
 385                            390                            395                            400  
 Val Ala Met Phe Pro Pro Thr Ser Ile Tyr His Val Phe His Ser Arg  
                             405                            410                            415  
 Lys Asp Cys Ala Asp Pro Cys Asp Ser  
                             420                            425

&lt;210&gt; 67

&lt;211&gt; 149

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 67

Met Glu Thr Leu Tyr Arg Val Pro Phe Leu Val Leu Glu Cys Pro Asn  
           1                            5                            10                            15  
 Leu Lys Leu Lys Lys Pro Pro Trp Leu His Met Pro Ser Ala Met Thr  
                             20                            25                            30  
 Val Tyr Ala Leu Val Val Val Ser Tyr Phe Leu Ile Thr Gly Gly Il

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35 40 45  
 Ile Tyr Asp Val Ile Val Glu Pro Pro Ser Val Gly Ser Met Thr Asp  
 50 55 60  
 Glu His Gly His Gln Arg Pro Val Ala Phe Leu Ala Tyr Arg Val Asn  
 65 70 75 80  
 Gly Gln Tyr Ile Met Glu Gly Leu Ala Ser Ser Phe Leu Phe Thr Met  
 85 90 95  
 Gly Gly Leu Gly Phe Ile Ile Leu Asp Arg Ser Asn Ala Pro Asn Ile  
 100 105 110  
 Pro Lys Leu Asn Arg Phe Leu Leu Leu Phe Ile Gly Phe Val Cys Val  
 115 120 125  
 Leu Leu Ser Phe Phe Met Ala Arg Val Phe Met Arg Met Lys Leu Pro  
 130 135 140  
 Gly Tyr Leu Met Gly  
 145

&lt;210&gt; 68

&lt;211&gt; 396

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 68

Met Ala Met Ile Glu Leu Gly Phe Gly Arg Gln Asn Phe His Pro Leu  
 1 5 10 15  
 Lys Arg Lys Ser Ser Leu Leu Leu Lys Leu Ile Ala Val Val Phe Ala  
 20 25 30  
 Val Leu Leu Phe Cys Glu Phe Leu Ile Tyr Tyr Leu Ala Ile Phe Gln  
 35 40 45  
 Cys Asn Trp Pro Glu Val Lys Thr Thr Ala Ser Asp Gly Glu Gln Thr  
 50 55 60  
 Thr Arg Glu Pro Val Leu Lys Ala Met Phe Leu Ala Asp Thr His Leu  
 65 70 75 80  
 Leu Gly Glu Phe Leu Gly His Trp Leu Asp Lys Leu Arg Arg Glu Trp  
 85 90 95  
 Gln Met Glu Arg Ala Phe Gln Thr Ala Leu Trp Leu Leu Gln Pro Glu  
 100 105 110

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Val Val Phe Ile Leu Gly Asp Ile Phe Asp Glu Gly Lys Trp Ser Thr  
 115 120 125  
 Pro Glu Ala Trp Ala Asp Asp Val Glu Arg Phe Gln Lys Met Phe Arg  
 130 135 140  
 His Pro Ser His Val Gln Leu Lys Val Val Ala Gly Asn His Asp Ile  
 145 150 155 160  
 Gly Phe His Tyr Glu Met Asn Thr Tyr Lys Val Glu Arg Phe Glu Lys  
 165 170 175  
 Val Phe Ser Ser Glu Arg Leu Phe Ser Trp Lys Gly Ile Asn Phe Val  
 180 185 190  
 Met Val Asn Ser Val Ala Leu Asn Gly Asp Gly Cys Gly Ile Cys Ser  
 195 200 205  
 Glu Thr Glu Ala Glu Leu Ile Glu Val Ser His Arg Leu Asn Cys Ser  
 210 215 220  
 Arg Glu Ala Arg Gly Ser Ser Arg Cys Gly Pro Gly Pro Leu Leu Pro  
 225 230 235 240  
 Thr Ser Ala Pro Val Leu Leu Gln His Tyr Pro Leu Tyr Arg Arg Ser  
 245 250 255  
 Asp Ala Asn Cys Ser Gly Glu Asp Ala Ala Pro Ala Glu Glu Arg Asp  
 260 265 270  
 Ile Pro Phe Lys Glu Asn Tyr Asp Val Leu Ser Arg Glu Ala Ser Gln  
 275 280 285  
 Lys Leu Leu Trp Trp Leu Gln Pro Arg Leu Val Leu Ser Gly His Thr  
 290 295 300  
 His Ser Ala Cys Glu Val His His Gly Gly Arg Val Pro Glu Leu Ser  
 305 310 315 320  
 Val Pro Ser Phe Ser Trp Arg Asn Arg Asn Asn Pro Ser Phe Ile Met  
 325 330 335  
 Gly Ser Ile Thr Pro Thr Asp Tyr Thr Leu Ser Lys Cys Tyr Leu Pro  
 340 345 350  
 Arg Glu Asp Val Val Leu Ile Ile Tyr Cys Gly Val Val Gly Phe Leu  
 355 360 365  
 Val Val Leu Thr Leu Thr His Phe Gly Leu Leu Ala Ser Pro Phe Leu  
 370 375 380  
 Ser Gly Leu Asn Leu Leu Gly Lys Arg Lys Thr Arg

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385

390

395

&lt;210&gt; 69

&lt;211&gt; 350

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 69

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Met Ile Arg Gln Glu Arg Ser Thr Ser Tyr Gln Glu Leu Ser Glu Glu
  1             5             10             15
Leu Val Gln Val Val Glu Asn Ser Glu Leu Ala Asp Glu Gln Asp Lys
             20             25             30
Glu Thr Val Arg Val Gln Gly Pro Gly Ile Leu Pro Gly Leu Asp Ser
             35             40             45
Glu Ser Ala Ser Ser Ser Ile Arg Phe Ser Lys Ala Cys Leu Lys Asn
             50             55             60
Val Phe Ser Val Leu Leu Ile Phe Ile Tyr Leu Leu Leu Met Ala Val
             65             70             75             80
Ala Val Phe Leu Val Tyr Arg Thr Ile Thr Asp Phe Arg Glu Lys Leu
             85             90             95
Lys His Pro Val Met Ser Val Ser Tyr Lys Glu Val Asp Arg Tyr Asp
             100            105            110
Ala Pro Gly Ile Ala Leu Tyr Pro Gly Gln Ala Gln Leu Leu Ser Cys
             115            120            125
Lys His His Tyr Glu Val Ile Pro Pro Leu Thr Ser Pro Gly Gln Pro
             130            135            140
Gly Asp Met Asn Cys Thr Thr Gln Arg Ile Asn Tyr Thr Asp Pro Phe
             145            150            155            160
Ser Asn Gln Thr Val Lys Ser Ala Leu Ile Val Gln Gly Pro Arg Glu
             165            170            175
Val Lys Lys Arg Glu Leu Val Phe Leu Gln Phe Arg Leu Asn Lys Ser
             180            185            190
Ser Glu Asp Phe Ser Ala Ile Asp Tyr Leu Leu Phe Ser Ser Phe Gln
             195            200            205
Glu Phe Leu Gln Ser Pro Asn Arg Val Gly Phe Met Gln Ala Cys Glu
             210            215            220

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Ser Ala Tyr Ser Ser Trp Lys Phe Ser Gly Gly Phe Arg Thr Trp Val  
 225                      230                      235                      240  
 Lys Met Ser Leu Val Lys Thr Lys Glu Glu Asp Gly Arg Glu Ala Val  
                          245                      250                      255  
 Glu Phe Arg Gln Glu Thr Ser Val Val Asn Tyr Ile Asp Gln Arg Pro  
                          260                      265                      270  
 Ala Ala Lys Lys Ser Ala Gln Leu Phe Phe Val Val Phe Glu Trp Lys  
                          275                      280                      285  
 Asp Pro Phe Ile Gln Lys Val Gln Asp Ile Val Thr Ala Asn Pro Trp  
                          290                      295                      300  
 Asn Thr Ile Ala Leu Leu Cys Gly Ala Phe Leu Ala Leu Phe Lys Ala  
 305                      310                      315                      320  
 Ala Glu Phe Ala Lys Leu Ser Ile Lys Trp Met Ile Lys Ile Arg Lys  
                          325                      330                      335  
 Arg Tyr Leu Lys Arg Arg Gly Gln Ala Thr Ser His Ile Ser  
                          340                      345                      350

&lt;210&gt; 70

&lt;211&gt; 153

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 70

Met Thr Ile His Ile Leu Ile Leu Leu Leu Leu Ala Phe Ser Ala  
                          1                      5                      10                      15  
 Gln Gly Asp Leu Asp Thr Ala Ala Arg Arg Gly Gln His Gln Val Pro  
                          20                      25                      30  
 Gln His Arg Gly His Val Cys Tyr Leu Gly Val Cys Arg Thr His Arg  
                          35                      40                      45  
 Leu Ala Glu Ile Ile Tyr Trp Ile Arg Cys Leu His Gln Gly Ala Leu  
                          50                      55                      60  
 Gly Glu Gly Gln Pro Arg Ala Pro Gly Pro Leu Gln Leu Trp Ala Pro  
                          65                      70                      75                      80  
 Pro Val Ala Arg Gly Gly Ser Pro Ala Arg Phe Pro Gly Phe Arg Pro  
                          85                      90                      95  
 Ala Ala Arg Gly Leu Ala Gln Cys Pro Ala Arg Trp Val Thr Ser Gly

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100	105	110
Thr Ala Arg Pro Leu Leu Gly Phe Ser Leu Pro Ile Cys Met Leu Glu		
115	120	125
Leu Leu Leu His Ile Ser Ser Pro Leu Thr Pro Ala Pro Glu Thr Val		
130	135	140
Phe Pro Ser Pro Ser Pro Gly Cys Asp		
145	150	

&lt;210&gt; 71

&lt;211&gt; 1176

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 71

atggagggag tgagcgcgct gctggcccgc tgccccacgg ccggcctggc cggcggcctg	60
gggggtcacgg cgtgcgcgcg gcccgggcgtg ttgctctacc ggatcgcgcg gaggatgaag	120
ccaacgcaca cgatgggtcaa ctgctgggttc tgcaaccagg atacgtggt gccctatggg	180
aaccgcaact gctgggactg tccccactgc gagcagtaca acggcttcca ggagaacggc	240
gactacaaca agccgatccc cgcccagtac ttggagcacc tgaaccacgt ggtgagcagc	300
gcgcccagcc tgcgcgaccc ttgcgagccg cagcagtggg tgagcagcca agtcctgctg	360
tgaagaggt gcaaccacca ccagaccacc aagatcaagc agctggccgc cttcgctccc	420
cgcgaggagg gcaggtatga cgaggaggtc gaggtgtacc ggcacacac ggagcagatg	480
tacaagctgt gccggccgtg ccaagcggct gtggagtact acatcaagca ccagaaccgc	540
cagctgcgcg ccctgttgct cagccaccag ttcaagcgcc gggaggccga ccagaccac	600
gcacagaact tctcctccgc cgtgaagtcc ccggtccagg tcatectgct ccgtgccctc	660
gccttcctgg cctgcgcctt cctactgacc accgcgctgt atggggccag cggacacttc	720
gccccaggca ccaactgtgcc cctggccctg ccacctggtg gcaatggctc agccacacct	780
gacaatggca ccaccctgg ggcgaggggc tggcggcagt tgctgggcct actccccgag	840
cacatggcgg agaagctgtg tgaggcctgg gcctttgggc agagccacca gacgggcgtc	900
gtggcactgg gcctactcac ctgectgctg gcaatgctgc tggetggccg catcaggctc	960
cggaggatcg atgccttctg cacctgcctg tgggcccctg tgctggggct gcacctggct	1020
gagcagcacc tgcaggccgc ctgcctagc tggctagaca cgctcaagtt cagcaccaca	1080
tctttgtgct gcctggttg cttcacggcg gctgtggcca caaggaaggc aacgggccc	1140
cggaggttcc ggccccgaag gtcagagaag cagcca	1176

&lt;210&gt; 72

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&lt;211&gt; 1491

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 72

```
atggcgctgt ggcgcggctc cgcgtacgcg ggcttcctgg cgctggccgt gggctgcgtc      60
ttcctgctgg agccagagct gccaggtcgc gcgctgcgct ctctctggag ctgctgtgt      120
ctggggcccg cgcctgcgc cccgggaccc gtctcccccg agggccggtt ggcggcagcc      180
tgggacgcgc ttatcgtgcg gccagtcggy cgctggcgcc gcgtggcagt gggagtcaat      240
gcatgtgttg atgtggtgct ctgaggggtg aagctcttgc aggcacttgg ccttagtcct      300
gggaatggga aagatcacag cattctgcat tcaaggaatg atctggaaga agccttcatt      360
cacttcatgt ggaagggagc agctgctgag cgcttcttca gtgataagga aacttttcac      420
gacattgcc aggttgcgtc agagttccca ggagcccagc actatgtagg aggaaatgca      480
gctttaattg gacagaaatt tgcagccaac tcagatttaa aggttcttct ttgcggtcca      540
gttgggccaa ggctacatga gcttcttgat gacaatgtct ttgttccacc agagtcattg      600
caggaagtgg atgagttcca cctcatttta gagtatcaag caggggagga gtggggccag      660
ttaaaagctc cccatgccaa ccgattoatc ttctctcacg acctctccaa cggggccatg      720
aatatgctgg aggtgtttgt gtctagcctg gaggagtttc agccagacct ggtggtcctc      780
tctggattgc acatgatgga gggacaaagc aaggagctcc agaggaagag actcttgag      840
gttgtaacct ccatttctga catccccact ggtattccag ttcacctaga gctggccagt      900
atgactaaca gggagctcat gagcagcatt gtccatcagc aggtctttcc cgcggtgact      960
tcccttgggc tgaatgaaca ggagctgtta tttctcacc agtcagctc tggacctcac      1020
tcttctctct ctctctggaa cgggtgtcct gatgtgggca tggtcagtga catcctcttc      1080
tggtatcttg aagaacatgg gaggagtaaa agcagagcct cggatctcac caggatccat      1140
ttccacacgc tgggtctacca catcctggca actgtggatg gacactgggc caaccagctg      1200
gcagccgtgg ctgcaggagc tcgtgtggct gggacacagg cctgcgccac agaaaccata      1260
gacaccagcc gagtgtctct gagggcacc caagagttca tgacttccca ttcggaggga      1320
ggctccagga ttgtattaaa cccaaacaag ccagtagtag aatggcacag agagggaata      1380
tccttcact tcacaccagt attggtgtgt aaagacccca ttcgaactgt aggccttgga      1440
gatgccattt cagccgaagg actcttctat tcggaagta caccctcacta t      1491
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&lt;210&gt; 73

&lt;211&gt; 1251

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 73



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atgctggtgc atttatttcg ggtcgggatt cggggtggcc cattcccagg caggctgcta      60
ccgcccctcc gcttccagac attctcagct gtcaggtaact ctgatggcta ccgcagctcc      120
tcccctctcc gggccgtggc ccacctgcgg tcccagctct gggcccacct ccctcgagcc      180
cccctagctc ccagatggag cccctctgcc tgggtgctggg ttgggggagc cctgctaggg      240
cccatggtag tgagtaagca tccccacctc tgccttgtgg ccctgtgtga ggcagaagag      300
gcccctctcg ccagctccac accccatgtc gtgggggtctc gctttaactg gaagctcttc      360
tggcagtttc tgcaccccca cctgctggte ctgggggtag ccgtcgtgtt ggccttgggt      420
gcggcactcg tgaatgtaca gatccccctg ctctctgggc agctggtaga ggtcgtggcc      480
aagtacacaa gggaccacgt agggagtttc atgactgagt ccagaatct cagcaccac      540
ctgottatcc tctatggtgt ccagggactg ctgaccttcg ggtacctggt gctgctgtcc      600
cacgttgccg agcgcagtcg tgtggacatg cggaggggcc tcttcagctc cctgctccgg      660
tactgccagc cgcagggtgc agagttggga caagacatca cttctttga cgccaataag      720
acagggcagc tggtagagcg cttgacaact gacgtgcagg agtttaagtc atccttcaag      780
cttgtcatct cccaggggct gcgaagctgc acccagggtg caggctgcct ggtgtccctg      840
tccatgctgt cgacacgcct cacgctgctg ctgatgggtg ccacaccagc cctgatggga      900
gtgggcaccc tgatgggtc aggcctccga aaattgtctt gccagtgtca ggagcagatc      960
gccagggcaa tgggcgtagc agacgagggc ctgggcaatg tgcggactgt gctgccttc      1020
gccatggagc aacgggaaga ggagcgctat ggggcagagc tggaaagctg ccgtgcggg      1080
gcagaggagc tgggcgcggg catcgctctg ttccaagggc tttccaacat cgccttcaac      1140
tgcatggtct tgggtaccct atttattggg ggctcccttg tggccggaca gcagctgaca      1200
gggggagacc tcatgtcctt cctggtggcc tcccagacag tgcaaaggct g      1251

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&lt;210&gt; 74

&lt;211&gt; 1947

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 74

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atgattccta accagcataa tgctggagcc gggagccacc aacctgcagt tttcagaatg      60
gccgtgttgg acactgattt ggatcacatt cttccatctt ctgttcttcc tccattctgg      120
gctaagttag tagtgggatc gggtgccatt gtgtgttttg cacgcagcta tgatggagac      180
tttgtctttg atgaotcaga agctattgtt aacaataagg ttgctggtgt tgcggccgt      240
gcagacctcc tgtgtgccct gttctctctg ttatctttcc ttggctactg taaagcattt      300
agagaaagta acaaggaggg agcgcattct tccaccttct ggggtgctgt gagtatcttt      360
ctgggagcag tggccatgct gtgcaaagag caagggatca ctgtgtggg tttaaatgcg      420
gtatttgaca tcttggtgat aggcaaattc aatgttctgg aaattgtcca gaaggtaacta      480

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cataaggaca agtcattaga gaatctcggc atgctcagga acgggggcct cctcttcaga 540  
atgaccctgc tcacctctgg aggggctggg atgctctacg tgcgctggag gatcatgggc 600  
acggggcccg cgcccttcac cgaggtggac aaccggcct cctttgctga cagcatgctg 660  
gtgagggccg taaactacaa ttactactat tcattgaatg cctggctgct gctgtgtccc 720  
tggtggctgt gttttgattg gtcaatgggc tgcaccccc tcattaagtc catcagcgac 780  
tggagggtaa ttgcacttgc agcactctgg ttctgcctaa ttggcctgat atgccaagcc 840  
ctgtgctctg aagacggcca caagagaagg atccttactc tgggcctggg atttctcgtt 900  
atcccatttc tccccgcgag taacctgttc ttccgagtgg gcttcgtggg cgcgagcgt 960  
gtcctctacc tccccagcat tgggtactgt gtgctgctga cttttggatt cggagccctg 1020  
agcaaacata ccaagaaaaa gaaactcatt gccgctgtcg tgetgggaat cttattcacc 1080  
aacacgctga gatgtgtgct gcgcagcggc gaggggcgga gtgaggaaaca gcttttcaga 1140  
agtgtctgt ctgtgtgtcc cctcaatget aagggttact acaacattgg caaaaacctg 1200  
gctgataaag gcaaccagac agctgccatc agatactacc gggagctgt aagattaaat 1260  
cccaagtatg ttcattgccat gaataatctt ggaaatatct taaaagaaag gaatgagcta 1320  
caggaaagtg aggagctgct gtcttttggc gtccaaatac agccagactt tgccgctgcg 1380  
tggtatgaatc taggcatagt gcagaatagc ctgaaacggg ttgaagcagc agagcaaagt 1440  
taccggacag caattaaaca cagaaggaaa taccagact gtactacaa cctcggggcgt 1500  
ctgtatgcag atctcaatcg ccacgtggat gccttgaatg cgtggagaaa tgccaccgtg 1560  
ctgaaaccag agcacagcct ggcctggaac aacatgatta tactcctcga caatacaggt 1620  
aatttagccc aagctgaagc agttggaaga gaggcactgg aattaatacc taatgatcac 1680  
tctctcatgt tctogttggc aaacgtgctg gggaaatccc agaaatacaa ggaatctgaa 1740  
gctttattcc tcaaggcaat taaagcaaat ccaaagtctg caagttacca tggtaatattg 1800  
gctgtgcttt atcatcgttg gggacatcta gacttggcca agaaacacta tgaaatctcc 1860  
ttgcagcttg accccacggc atcaggaact aaggagaatt acggtctgct gagaagaaag 1920  
ctagaactaa tgcaaaagaa agctgtc 1947

&lt;210&gt; 75

&lt;211&gt; 279

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 75

atgatccatc tgggtcacat cctcttcctg cttttgctcc cagtggctgc agctcagacg 60  
actccaggag agagatcacc actccctgcc ttttaccctg gcacttcagg ctcttgttcc 120  
ggatgtgggt ccctctctct gccgctcctg gcaggcctcg tggctgctga tgcgggtggca 180  
tcgctgctca tcgtgggggc ggtgttcctg tgccgcagcc caccgcgcag ccccgcccaa 240

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gaagatggca aagtctacat caacatgccca ggcaggggc

279

&lt;210&gt; 76

&lt;211&gt; 1275

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 76

atgggctcct gggctgcggt caatgggata tgggtggagc tacctgtggt ggtcaaagag	60
cttccagagg gttggagcct cccctcttac gtctctgtgc ttgtggctct ggggaacctg	120
ggtctgctgg tggtagccct ctggaggagg ctggccccag gaaaggacga gcagggtccc	180
atccgggtgg tgcagggtct gggcatgggt ggcacagccc tgctggctc tctgtggcac	240
catgtggccc cagtggcagg acagttgcat tctgtggcct tcttagcaact ggcctttgtg	300
ctggcaactgg catgctgtgc ctgaatgtc actttcctgc ccttcttgag ccacctgcca	360
cctcgcttct tacggtcatt ctctctgggt caaggcctga gtgccctgct gccctgcgtg	420
ctggccctag tgcagggtgt gggccgcctc gagtggccgc cagcccccat caacggcacc	480
cctggccccc cgtctgaatt ccttgagcgt ttcccgcca gcaccttctt ctgggcaactg	540
actgcccttc tggctcgctc agctgctgcc ttccagggtc ttctgctgct gttgcgcgcca	600
ccaccatctg taccacagg ggagttagga tcaggcctcc aggtgggagc cccaggagca	660
gaggaagagg tggaagagtc ctcaccactg caagagccac caagccaggc agcaggcacc	720
acccttggtc cagaccctaa ggcctatcag cttctatcag cccgcagtgc ctgcctgctg	780
ggcctgttgg ccgccaccaa cgcgtgacc aatggcgtgc tgctgcccgt gcagagcttt	840
tcctgottac cctacgggag tctggcctac cacttggtg tgggtgctggg cagtgtgcc	900
aatcccctgg cctgcttctt ggcctagggt gtgctgtgca ggtccttggc agggctgggc	960
ggcctctctc tgctgggagt gttctgtggg ggctacctga tggcgtggc agtcctgagc	1020
ccctgcccgc ccctggtggg cacctcggcg ggggtggtcc tcgtggtgct gtcgtgggtg	1080
ctgtgtcttg gcgtgtctc ctacgtgaag gtggcagcca gctccctgct gcattggcggg	1140
ggcgggcgg cattgtggc agcggcggtg gccatccagg tgggtctctt gctcggcgt	1200
gttgetatgt tcccccgac cagcatctat cactgttcc acagcagaaa ggactgtgca	1260
gacctctgtg actcc	1275

&lt;210&gt; 77

&lt;211&gt; 447

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 77

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atggagactt tgtaccgtgt cccgttctta gtgctcgaat gtcccaacct gaagctgaag	60
aagccgccct ggttgccat gccgtcgcc atgactgtgt atgctctggt ggtggtgtct	120
tacttctca tcaccggagg aataatttat gatgttattg ttgaacctcc aagtgtcgg	180
tctatgactg atgaacatgg gcacagagg ccagtagctt tcttgcccta cagagtaaat	240
ggacaatata ttatggaagg acttgcaccc agcttccat ttacaatggg aggttttagt	300
ttcataatcc tggaccgatc gaatgcacca aatatcccaa aactcaatag attccttctt	360
ctgttcattg gattcgtctg tgcctattg agttttttca tggctagagt attcatgaga	420
atgaaactgc cgggctatct gatgggt	447

&lt;210&gt; 78

&lt;211&gt; 1188

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 78

atggcgatga tcgaattggg gtttgaaga cagaattttc atccattaaa gaggaagagt	60
tcattgctgt tgaaactcat agctgttgct tttgctgtgc ttctattttg tgaattttta	120
atctattact tagcgatctt tcagtgtaat tggcctgaag tgaaaaccac agcctctgat	180
ggtgaacaga ccacacgtga gcctgtgtgc aaagccatgt ttttggctga caccatttg	240
cttggggaat tcctaggcca ctggctggac aaattacgaa gggaatggca gatggagaga	300
gcggtccaga cagctctgtg gttgctgcag ccggaagtcg tcttcacctc gggggatata	360
tttgatgaag ggaagtggag caccctgag gcctggggcg atgatgtgga gcggtttcag	420
aaaatgttca gacaccaag tcatgtacag ctgaaggtag ttgctggaaa ccatgacatt	480
ggcttccatt atgagatgaa cacatacaaa gtagaacgct ttgagaaagt gttcagctct	540
gaaagactgt tttcttggaa aggcattaac tttgtgatgg tcaacagcgt ggcgctgaac	600
ggggatggct gtggcatctg ctctgaaaca gaagcagagc tcattgaagt ttctcacaga	660
ctgaactgct ccgagaggc acgtggctcc agccggtgtg gacctgggcc tctgctgccc	720
acgtctgccc ctgtcctctc gcagcattat cctctgtatc ggagaagtga tgctaactgt	780
tctggggaag acgctgtccc tgcagaggaa agggacatcc catttaagga gaactatgac	840
gtgctttcac gggaggcatc acaaaagctg ctgtggtggc tccagccgcg cctggttctc	900
agtggccaca cgcacagcgc ctgagaggtg caccacgggg gccgagtcgc cgagctcagc	960
gtcccatctt tcagttggag gaacagaaac aaccccagtt tcatcatggg tagcatcacg	1020
cccacagact acacctctc caagtgtac ctcccacgtg aggatgtggt tttgatcatc	1080
tactgtggag tgggtggctt ccttgtgtgc ctcaactca ctcaactttg gcttctagcc	1140
tcaccttttc tttctggtt gaactgtctc ggaaagcgtg agacaaga	1188

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&lt;210&gt; 79

&lt;211&gt; 1050

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 79

atgatccggc aggagcgctc cacatcctac caggagctga gtgaggagt ggccaggtg	60
gttgagaact cagagctggc agacgagcag gacaaggaga cggtcagagt ccaaggccg	120
ggtatcttac caggcctgga cagcgagtcc gccccagca gcatccgctt cagcaaggcc	180
tgcctgaaga acgtcttctc ggtcctactc atcttcatct acctgctgct catggctgtg	240
gccgtcttcc tggctctaccg gaccatcaca gaacttctgt agaaactcaa gcacctgtc	300
atgtctgtgt cttacaagga agtggatcgc tatgatgccc caggtattgc cttgtacccc	360
ggtcaggccc agttgctcag ctgtaagcac cattacgagg tcattcctcc tctgacaagc	420
cctggccagc cgggtgacat gaattgcacc acccagagga tcaactacac ggaccttcc	480
tccaatcaga ctgtgaaatc tgccctgatt gtccaggggc cccgggaagt gaaaaagcgg	540
gagctgggtc tctccagtt ccgcctgaac aagagtagtg aggacttcag cgccattgat	600
tacctcctct tctcttcttt ccaggagtcc ctgcaaagcc caaacagggt aggttcatg	660
caggcctgtg agagtgccta ttccagctgg aagtctcttg ggggcttccg cacctgggtc	720
aagatgtcac tggtaaagac caaggaggag gatgggcggg aagcagtggg gttccggcag	780
gagacaagtg tggttaacta cattgaccag aggccagctg ccaaaaaaag tgcctcaattg	840
ttttttgtgg tctttgaatg gaaagatcct ttcattccaga aagtccaaga tatagtcact	900
gccaatcctt ggaacacaat tgccttctc tgtggcgctc tcttggcatt atttaaagca	960
gcagagtttg ccaaaactgag tataaaatgg atgatcaaaa ttagaaagag ataccttaa	1020
agaagagggtc aggaacagag ccacataagc	1050

&lt;210&gt; 80

&lt;211&gt; 459

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 80

atgactatcc acatcctcat cctgctgttg ctctcgcct tctccgcca aggggacctg	60
gacactgcag ccaggcgagg ccagcaccag gtccccagc acccggggca cgtctgtac	120
ctgggcgtat gccggacca ccgcctggcg gagatcatat actggattcg ctgtctccac	180
caaggagccc tcggggaagg ccagccacga gccccaggac ccctacagct atgggcgccg	240
ccggtggcgc gaggcggaag cccggctcgg ttcccaggat tccggcctgc agcgaggggg	300
ctagcgcagt gccagctcg ctgggtgacc tcgggcacgg ctctccct cctcggttc	360

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agtttgcta tctgtatgtt ggagcttcta ctccacattt cttctccccct aactccagcc 420  
cctgaaaccg tottcccag tccctccccg ggetgagac 459

&lt;210&gt; 81

&lt;211&gt; 4027

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (192)...(1370)

&lt;400&gt; 81

gcccgtaca aagcggcgaa ggtcacggcg cgaggaggcg cgcgtcgccg ccccggtcc 60  
cgctggggc ccgcgcccc ggcgtaaccg cctcctgcc gctgcccgc ctgccgcct 120  
gcccgcctac ccgcctacc gcctaccgc ctacccccct gccggcctgc cgtcctcca 180  
cgcgagagc c atg gag gga gtg agc gcg ctg ctg gcc cgc tgc ccc acg 230  
Met Glu Gly Val Ser Ala Leu Leu Ala Arg Cys Pro Thr  
1 5 10  
gcc ggc ctg gcc ggc ggc ctg ggg gtc acg gcg tgc gcc gcg gcc ggc 278  
Ala Gly Leu Ala Gly Gly Leu Gly Val Thr Ala Cys Ala Ala Ala Gly  
15 20 25  
gtg ttg ctc tac cgg atc gcg cgg agg atg aag cca acg cac acg atg 326  
Val Leu Leu Tyr Arg Ile Ala Arg Arg Met Lys Pro Thr His Thr Met  
30 35 40 45  
gtc aac tgc tgg ttc tgc aac cag gat acg ctg gtg ccc tat ggg aac 374  
Val Asn Cys Trp Phe Cys Asn Gln Asp Thr Leu Val Pro Tyr Gly Asn  
50 55 60  
cgc aac tgc tgg gac tgt ccc cac tgc gag cag tac aac ggc ttc cag 422  
Arg Asn Cys Trp Asp Cys Pro His Cys Glu Gln Tyr Asn Gly Phe Gln  
65 70 75  
gag aac ggc gac tac aac aag ccg atc ccc gcc cag tac ttg gag cac 470  
Glu Asn Gly Asp Tyr Asn Lys Pro Ile Pro Ala Gln Tyr Leu Glu His  
80 85 90  
ctg aac cac gtg gtg agc agc gcg ccc agc ctg cgc gac cct tcg cag 518  
Leu Asn His Val Val Ser Ser Ala Pro Ser Leu Arg Asp Pro Ser Gln  
95 100 105

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ccg cag cag tgg gtg agc agc caa gtc ctg ctg tgc aag agg tgc aac	566
Pro Gln Gln Trp Val Ser Ser Gln Val Leu Leu Cys Lys Arg Cys Asn	
110 115 120 125	
cac cac cag acc acc aag atc aag cag ctg gcc gcc ttc gct ccc cgc	614
His His Gln Thr Thr Lys Ile Lys Gln Leu Ala Ala Phe Ala Pro Arg	
130 135 140	
gag gag gcc agg tat gac gag gag gtc gag gtg tac cgg cat cac ctg	662
Glu Glu Gly Arg Tyr Asp Glu Glu Val Glu Val Tyr Arg His His Leu	
145 150 155	
gag cag atg tac aag ctg tgc cgg ccg tgc caa gcg gct gtg gag tac	710
Glu Gln Met Tyr Lys Leu Cys Arg Pro Cys Gln Ala Ala Val Glu Tyr	
160 165 170	
tac atc aag cac cag aac cgc cag ctg cgc gcc ctg ttg ctc agc cac	758
Tyr Ile Lys His Gln Asn Arg Gln Leu Arg Ala Leu Leu Leu Ser His	
175 180 185	
cag ttc aag cgc cgg gag gcc gac cag acc cac gca cag aac ttc tcc	806
Gln Phe Lys Arg Arg Glu Ala Asp Gln Thr His Ala Gln Asn Phe Ser	
190 195 200 205	
tcc gcc gtg aag tcc ccg gtc cag gtc atc ctg ctc cgt gcc ctc gcc	854
Ser Ala Val Lys Ser Pro Val Gln Val Ile Leu Leu Arg Ala Leu Ala	
210 215 220	
ttc ctg gcc tgc gcc ttc cta ctg acc acc gcg ctg tat ggg gcc agc	902
Phe Leu Ala Cys Ala Phe Leu Leu Thr Thr Ala Leu Tyr Gly Ala Ser	
225 230 235	
gga cac ttc gcc cca gcc acc act gtg ccc ctg gcc ctg cca cct ggt	950
Gly His Phe Ala Pro Gly Thr Thr Val Pro Leu Ala Leu Pro Pro Gly	
240 245 250	
ggc aat gcc tca gcc aca cct gac aat gcc acc acc cct ggg gcc gag	998
Gly Asn Gly Ser Ala Thr Pro Asp Asn Gly Thr Thr Pro Gly Ala Glu	
255 260 265	
ggc tgg cgg cag ttg ctg gcc cta ctc ccc gag cac atg gcg gag aag	1046
Gly Trp Arg Gln Leu Leu Gly Leu Leu Pro Glu His Met Ala Glu Lys	
270 275 280 285	
ctg tgt gag gcc tgg gcc ttt ggg cag agc cac cag acg gcc gtc gtg	1094
Leu Cys Glu Ala Trp Ala Phe Gly Gln Ser His Gln Thr Gly Val Val	

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290	295	300	
gca ctg ggc cta ctc acc tgc ctg ctg gca atg ctg ctg gct ggc cgc			1142
Ala Leu Gly Leu Leu Thr Cys Leu Leu Ala Met Leu Leu Ala Gly Arg			
305	310	315	
atc agg ctc cgg agg atc gat gcc ttc tgc acc tgc ctg tgg gcc ctg			1190
Ile Arg Leu Arg Arg Ile Asp Ala Phe Cys Thr Cys Leu Trp Ala Leu			
320	325	330	
ctg ctg ggg ctg cac ctg gct gag cag cac ctg cag gcc gcc tgc cct			1238
Leu Leu Gly Leu His Leu Ala Glu Gln His Leu Gln Ala Ala Ser Pro			
335	340	345	
agc tgg cta gac acg ctc aag ttc agc acc aca tct ttg tgc tgc ctg			1286
Ser Trp Leu Asp Thr Leu Lys Phe Ser Thr Thr Ser Leu Cys Cys Leu			
350	355	360	
ggt ggc ttc acg gcg gct gtg gcc aca agg aag gca acg ggc cca cgg			1334
Val Gly Phe Thr Ala Ala Val Ala Thr Arg Lys Ala Thr Gly Pro Arg			
370	375	380	
agg ttc cgg ccc cga agg tca gag aag cag cca tgactgcggg ggg			1380
Arg Phe Arg Pro Arg Arg Ser Glu Lys Gln Pro			
385	390		
aggacacacg gatgctcagg cccaggcttt gccagggtccg aagcggggccc ctctctgtcc			1440
tgcctctttt cactgtctca cgccctccca cccccacct acagccccag gtccctggccc			1500
agtccctcca ctgcctcgaa gactcagttt gccctgcctt ttcctttcgg gcaccaccag			1560
ccatccccga gtgcctgtga gccactcacc actgctgcca cctctctggc caatggccct			1620
ttcactggcc tggtagctgg aatgtgggca gcgccacac aggctctggc ccatggcttc			1680
ctactggcag ctccaggcac cccctctca ccacgccgtt tgctggtctt gacactgttg			1740
ggtgagggtc ctggctctgc tgtcttccct tctggcctct gcacaggggt ggtgacagtg			1800
gctacaggct gggccctgg cgtgccctga ccgtgcagca gactgaggct ggggcagcag			1860
agagccccag cctcaccctt gaggagcacc tgtggtctgt ccccttggtc ctgcttatgg			1920
ctggaccggc cctgcaggag gtggtggagc cgtgaaggag gccgagctgc agctctggct			1980
gctgcttggc ctctgctcc aagacctcc cgagtccccg gaaatggaga gtgcagttct			2040
tgggcccagc ctggccttcg ccatgagttt ggggagcgag accccacctg agacaggcag			2100
taggagcctg tgctgacctt ggggaatctg agcttttcca agggtaaggg gccagggta			2160
tgcaggcctt cagtgcacac aggtcgttgt catcctttcc ctccctgacc tgtcacgagc			2220
ctctgcagggt gctgctcac catggcccag cgccactctg tctccgact caggtgaggg			2280
ggcagccac agacctgctc ctccagtagca gggcctggcc aggccctgc tgttctcagc			2340



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ctcagtttgc catctatgaa atgaggtgga cccctctcca tagcccttgg gtgccagctc 2400
agtgggtgtg gggatcacat gaggtggctc atgaggacac actctggaag tcgaggggct 2460
gccacgtgca gaggaagtcc cgggcctggg ggccttatcc aggggtccca gtcgagagtg 2520
gcccagggcc gtccctcacc gggcatgttc cctctggttg cccactccct cagggccccc 2580
atgtcctgcc actcgccact ctgagcacga gttcaccttc cagatgtggc caggggtgtgc 2640
cagctcctct ctctgtgctg ttggaacccc gggggaggca agagcagatc acaggtgcat 2700
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cactgctgtg aatctgccac gcctgggggt cctagaggct gccccacccc agtgattggg 2820
tagcagetca catccccccc agcttcacaa gtgaggaacc caggtgcacg gggagaccct 2880
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acccagccct gccaggaag gaacacatga cccttctgtc tgtgactgtt gctgagtctc 3900
tgtctcatgt cgtagaattg tggataattg tctagtgaac ctctcatcac tgtaaccatc 3960
gcgcctggcc tagatgtcgt gttttggatg ctgtgttttc aataaatgcc tctggggccc 4020
tgctttt 4027

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&lt;210&gt; 82

&lt;211&gt; 2495

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

133/233

&lt;221&gt; CDS

&lt;222&gt; (30)...(1523)

&lt;400&gt; 82

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gttcgcgcag gtggggcgcc tgggtcccc atg gcg ctg tgg cgc ggc tcc gcg      53
                               Met Ala Leu Trp Arg Gly Ser Ala
                               1             5

tac gcg ggc ttc ctg gcg ctg gcc gtg ggc tgc gtc ttc ctg ctg gag      101
Tyr Ala Gly Phe Leu Ala Leu Ala Val Gly Cys Val Phe Leu Leu Glu
    10             15             20

cca gag ctg cca ggc tcg gcg ctg cgc tct ctc tgg agc tcg ctg tgt      149
Pro Glu Leu Pro Gly Ser Ala Leu Arg Ser Leu Trp Ser Ser Leu Cys
    25             30             35             40

ctg ggg ccc gcg cct gcg ccc ccg gga ccc gtc tcc ccc gag ggc cgg      197
Leu Gly Pro Ala Pro Ala Pro Pro Gly Pro Val Ser Pro Glu Gly Arg
                45             50             55

ttg gcg gca gcc tgg gac gcg ctt atc gtg cgg cca gtc cgg cgc tgg      245
Leu Ala Ala Ala Trp Asp Ala Leu Ile Val Arg Pro Val Arg Arg Trp
                60             65             70

cgc cgc gtg gca gtg gga gtc aat gca tgt gtt gat gtg gtg ctc tca      293
Arg Arg Val Ala Val Gly Val Asn Ala Cys Val Asp Val Val Leu Ser
                75             80             85

ggg gtg aag ctc ttg cag gca ctt ggc ctt agt cct ggg aat ggg aaa      341
Gly Val Lys Leu Leu Gln Ala Leu Gly Leu Ser Pro Gly Asn Gly Lys
                90             95             100

gat cac agc att ctg cat tca agg aat gat ctg gaa gaa gcc ttc att      389
Asp His Ser Ile Leu His Ser Arg Asn Asp Leu Glu Glu Ala Phe Ile
    105             110             115             120

cac ttc atg tgg aag gga gca gct gct gag cgc ttc ttc agt gat aag      437
His Phe Met Trp Lys Gly Ala Ala Ala Glu Arg Phe Phe Ser Asp Lys
                125             130             135

gaa act ttt cac gac att gcc cag gtt gcg tca gag ttc cca gga gcc      485
Glu Thr Phe His Asp Ile Ala Gln Val Ala Ser Glu Phe Pro Gly Ala
                140             145             150

cag cac tat gta gga gga aat gca gct tta att gga cag aaa ttt gca      533
Gln His Tyr Val Gly Gly Asn Ala Ala Leu Ile Gly Gln Lys Phe Ala

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155	160	165	
gcc aac tca gat tta aag gtt ctt ctt tgc ggt cca gtt ggc cca agg			581
Ala Asn Ser Asp Leu Lys Val Leu Leu Cys Gly Pro Val Gly Pro Arg			
170	175	180	
cta cat gag ctt ctt gat gac aat gtc ttt gtt cca cca gag tca ttg			629
Leu His Glu Leu Leu Asp Asp Asn Val Phe Val Pro Pro Glu Ser Leu			
185	190	195	200
cag gaa gtg gat gag ttc cac ctc att tta gag tat caa gca ggg gag			677
Gln Glu Val Asp Glu Phe His Leu Ile Leu Glu Tyr Gln Ala Gly Glu			
205	210	215	
gag tgg ggc cag tta aaa gct ccc cat gcc aac cga ttc atc ttc tct			725
Glu Trp Gly Gln Leu Lys Ala Pro His Ala Asn Arg Phe Ile Phe Ser			
220	225	230	
cac gac ctc tcc aac ggg gcc atg aat atg ctg gag gtg ttt gtg tct			773
His Asp Leu Ser Asn Gly Ala Met Asn Met Leu Glu Val Phe Val Ser			
235	240	245	
agc ctg gag gag ttt cag cca gac ctg gtg gtc ctc tct gga ttg cac			821
Ser Leu Glu Glu Phe Gln Pro Asp Leu Val Val Leu Ser Gly Leu His			
250	255	260	
atg atg gag gga caa agc aag gag ctc cag agg aag aga ctc ttg gag			869
Met Met Glu Gly Gln Ser Lys Glu Leu Gln Arg Lys Arg Leu Leu Glu			
265	270	275	280
gtt gta acc tcc att tct gac atc ccc act ggt att cca gtt cac cta			917
Val Val Thr Ser Ile Ser Asp Ile Pro Thr Gly Ile Pro Val His Leu			
285	290	295	
gag ctg gcc agt atg act aac agg gag ctc atg agc agc att gtc cat			965
Glu Leu Ala Ser Met Thr Asn Arg Glu Leu Met Ser Ser Ile Val His			
300	305	310	
cag cag gtc ttt ccc gcg gtg act tcc ctt ggg ctg aat gaa cag gag			1013
Gln Gln Val Phe Pro Ala Val Thr Ser Leu Gly Leu Asn Glu Gln Glu			
315	320	325	
ctg tta ttt ctc acc cag tca gcc tct gga cct cac tct tct ctc tct			1061
Leu Leu Phe Leu Thr Gln Ser Ala Ser Gly Pro His Ser Ser Leu Ser			
330	335	340	
tcc tgg aac ggt gtt cct gat gtg ggc atg gtc agt gac atc ctc ttc			1109

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Ser Trp Asn Gly Val Pro Asp Val Gly Met Val Ser Asp Ile Leu Phe  
 345 350 355 360  
 tgg atc ttg aaa gaa cat ggg agg agt aaa agc aga gcc tcg gat ctc 1157  
 Trp Ile Leu Lys Glu His Gly Arg Ser Lys Ser Arg Ala Ser Asp Leu  
 365 370 375  
 acc agg atc cat ttc cac acg ctg gtc tac cac atc ctg gca act gtg 1205  
 Thr Arg Ile His Phe His Thr Leu Val Tyr His Ile Leu Ala Thr Val  
 380 385 390  
 gat gga cac tgg gcc aac cag ctg gca gcc gtg gct gca gga gct cgt 1253  
 Asp Gly His Trp Ala Asn Gln Leu Ala Ala Val Ala Ala Gly Ala Arg  
 395 400 405  
 gtg gct ggg aca cag gcc tgc gcc aca gaa acc ata gac acc agc cga 1301  
 Val Ala Gly Thr Gln Ala Cys Ala Thr Glu Thr Ile Asp Thr Ser Arg  
 410 415 420  
 gtg tct ctg agg gca ccc caa gag ttc atg act tcc cat tcg gag gca 1349  
 Val Ser Leu Arg Ala Pro Gln Glu Phe Met Thr Ser His Ser Glu Ala  
 425 430 435 440  
 ggc tcc agg att gta tta aac cca aac aag cca gta gta gaa tgg cac 1397  
 Gly Ser Arg Ile Val Leu Asn Pro Asn Lys Pro Val Val Glu Trp His  
 445 450 455  
 aga gag gga ata tcc ttc cac ttc aca cca gta ttg gtg tgt aaa gac 1445  
 Arg Glu Gly Ile Ser Phe His Phe Thr Pro Val Leu Val Cys Lys Asp  
 460 465 470  
 ccc att cga act gta ggc ctt gga gat gcc att tca gcc gaa gga ctc 1493  
 Pro Ile Arg Thr Val Gly Leu Gly Asp Ala Ile Ser Ala Glu Gly Leu  
 475 480 485  
 ttc tat tcg gaa gta cac cct cac tat taggaagatt cttaggggta 1540  
 Phe Tyr Ser Glu Val His Pro His Tyr  
 490 495  
 atttttctga ggaaggagaa ctagccaact taagaattac aggaagaaag tggtttgaa 1600  
 gacagccaaa gaaataaaaag cagattaaac tgtatcaggt acattccagc ctgttgcaa 1660  
 ctccataaaa acatttcaga ttttaatccg aatttageta atgagactgg atttttgttt 1720  
 tttatgttgt gtgtcacaga gctaaaaact cagttcccaa atccccagtt tatgcagcgc 1780  
 catcaggtat ttttaagctaa acttcttcac ccctgagagc atgtcagctg gagaaaagca 1840  
 gttcttctctt gcccaattga gaagtgcacg cccactcacc caacatcctg gtctctagga 1900

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aagcctcatg tgaggttcct cttcttttca gctcagtgcc catgggcaag gatcatgatt 1960  
tccattccgt gttacaatga caatatttaa tgagcataac cttctcagtc tcttgccttc 2020  
aaatttagga cagagccgct aaggacaaaa caatccctcc cgtgctttat gatggcagca 2080  
gggggtgggg agcctctgag ggactctttc attctgcagt tgtctggaag cctgggtggc 2140  
gtcatgagct gaaggatcat gctttcctgt cctggctcca taggttatag gctggctggg 2200  
gaaaggttca cgtggcccag gctgaacttc attgcctagc tttggatgtg ctttctgcca 2260  
taaagactga tttttgttcg ttctgagcct tcaaggaatt tgttttttac aactggaata 2320  
tgctcctgtg tgtgttaaca gatcatggat gttttatgtt ttcactgac atttaaagag 2380  
tttgacctca gagctccagg atcatcagta aatttgcct gttatatatt tattttttta 2440  
taaatacaaga cttctgtgtg ctcttaaata tattaataaac aatttacatt tcagg 2495

&lt;210&gt; 83

&lt;211&gt; 1617

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (67)...(1320)

&lt;400&gt; 83

atagagccct cagtgggatg aggggtgaaac tgcattgcc ggcggtcct gttttaccgc 60  
gtcagc atg ctg gtg cat tta ttt cgg gtc ggg att cgg ggt ggc cca 108  
Met Leu Val His Leu Phe Arg Val Gly Ile Arg Gly Gly Pro  
1 5 10  
ttc cca ggc agg ctg cta ccg ccc ctc cgc ttc cag aca ttc tca gct 156  
Phe Pro Gly Arg Leu Leu Pro Pro Leu Arg Phe Gln Thr Phe Ser Ala  
15 20 25 30  
gtc agg tac tct gat ggc tac cgc agc tcc tcc ctc ctc cgg gcc gtg 204  
Val Arg Tyr Ser Asp Gly Tyr Arg Ser Ser Ser Leu Leu Arg Ala Val  
35 40 45  
gcc cac ctg cgg tcc cag ctc tgg gcc cac ctc cct cga gcc ccc cta 252  
Ala His Leu Arg Ser Gln Leu Trp Ala His Leu Pro Arg Ala Pro Leu  
50 55 60  
gct ccc aga tgg agc ccc tct gcc tgg tgc tgg gtt ggg gga gcc ctg 300  
Ala Pro Arg Trp Ser Pro Ser Ala Trp Cys Trp Val Gly Gly Ala Leu  
65 70 75

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cta ggc ccc atg gta ctg agt aag cat ccc cac ctc tgc ott gtg gcc	348
Leu Gly Pro Met Val Leu Ser Lys His Pro His Leu Cys Leu Val Ala	
80 85 90	
ctg tgt gag gca gaa gag gcc cct cct gcc agc tcc aca ccc cat gtc	396
Leu Cys Glu Ala Glu Glu Ala Pro Pro Ala Ser Ser Thr Pro His Val	
95 100 105 110	
gtg ggg tct cgc ttt aac tgg aag ctc ttc tgg cag ttt ctg cac ccc	444
Val Gly Ser Arg Phe Asn Trp Lys Leu Phe Trp Gln Phe Leu His Pro	
115 120 125	
cac ctg ctg gtc ctg ggg gta gcc gtc gtg ctg gcc ttg ggt gcg gca	492
His Leu Leu Val Leu Gly Val Ala Val Val Leu Ala Leu Gly Ala Ala	
130 135 140	
ctc gtg aat gta cag atc ccc ctg ctc ctg gcc cag ctg gta gag gtc	540
Leu Val Asn Val Gln Ile Pro Leu Leu Leu Gly Gln Leu Val Glu Val	
145 150 155	
gtg gcc aag tac aca agg gac cac gta ggg agt ttc atg act gag tcc	588
Val Ala Lys Tyr Thr Arg Asp His Val Gly Ser Phe Met Thr Glu Ser	
160 165 170	
cag aat ctc agc acc cac ctg ctt atc ctc tat ggt gtc cag gga ctg	636
Gln Asn Leu Ser Thr His Leu Leu Ile Leu Tyr Gly Val Gln Gly Leu	
175 180 185 190	
ctg acc ttc ggg tac ctg gtg ctg ctg tcc cac gtt ggc gag cgc atg	684
Leu Thr Phe Gly Tyr Leu Val Leu Leu Ser His Val Gly Glu Arg Met	
195 200 205	
gct gtg gac atg cgg agg gcc ctc ttc agc tcc ctg ctc cgg tac tgc	732
Ala Val Asp Met Arg Arg Ala Leu Phe Ser Ser Leu Leu Arg Tyr Cys	
210 215 220	
cag ccg cag ggt gca gag ttg gga caa gac atc acc ttc ttt gac gcc	780
Gln Pro Gln Gly Ala Glu Leu Gly Gln Asp Ile Thr Phe Phe Asp Ala	
225 230 235	
aat aag aca ggg cag ctg gtg agc cgc ttg aca act gac gtg cag gag	828
Asn Lys Thr Gly Gln Leu Val Ser Arg Leu Thr Thr Asp Val Gln Glu	
240 245 250	
ttt aag tca tcc ttc aag ctt gtc atc tcc cag ggg ctg cga agc tgc	876
Phe Lys Ser Ser Phe Lys Leu Val Ile Ser Gln Gly Leu Arg Ser Cys	

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255	260	265	270	
acc cag gtg gca ggc tgc ctg gtg tcc ctg tcc atg ctg tcg aca cgc				924
Thr Gln Val Ala Gly Cys Leu Val Ser Leu Ser Met Leu Ser Thr Arg				
275	280	285		
ctc acg ctg ctg ctg atg gtg gcc aca cca gcc ctg atg gga gtg ggc				972
Leu Thr Leu Leu Leu Met Val Ala Thr Pro Ala Leu Met Gly Val Gly				
290	295	300		
acc ctg atg ggc tca ggc ctc cga aaa ttg tct tgc cag tgt cag gag				1020
Thr Leu Met Gly Ser Gly Leu Arg Lys Leu Ser Cys Gln Cys Gln Glu				
305	310	315		
cag atc gcc agg gca atg ggc gta gca gac gag gcc ctg ggc aat gtg				1068
Gln Ile Ala Arg Ala Met Gly Val Ala Asp Glu Ala Leu Gly Asn Val				
320	325	330		
cgg act gtg cgt gcc ttc gcc atg gag caa cgg gaa gag gag cgc tat				1116
Arg Thr Val Arg Ala Phe Ala Met Glu Gln Arg Glu Glu Glu Arg Tyr				
335	340	345	350	
ggg gca gag ctg gaa gcc tgc cgc tgc cgg gca gag gag ctg ggc cgc				1164
Gly Ala Glu Leu Glu Ala Cys Arg Cys Arg Ala Glu Glu Leu Gly Arg				
355	360	365		
ggc atc gcc ttg ttc caa ggg ctt tcc aac atc gcc ttc aac tgc atg				1212
Gly Ile Ala Leu Phe Gln Gly Leu Ser Asn Ile Ala Phe Asn Cys Met				
370	375	380		
gtc ttg ggt acc cta ttt att ggg ggc tcc ctt gtg gcc gga cag cag				1260
Val Leu Gly Thr Leu Phe Ile Gly Gly Ser Leu Val Ala Gly Gln Gln				
385	390	395		
ctg aca ggg gga gac ctc atg tcc ttc ctg gtg gcc tcc cag aca gtg				1308
Leu Thr Gly Gly Asp Leu Met Ser Phe Leu Val Ala Ser Gln Thr Val				
400	405	410		
caa agg ctg tgacattcca tgcattggaag gaccatcctt gacaggctgt gtg				1360
Gln Arg Leu				
415				
agctgccctt ccccatgcct gccacttcca gggatgacaa gctgaccctt gtccccacac				1420
acccaccct tatagcttat tgctttgcgt tgggtccaaaa ccaccgctc agctgagcct				1480
ctgggatgac cagagctgat caccagacag ctcaaggcgg gcctcccccc tccatatctt				1540
ttccaagcta aacacaagca gttctacata aatatgttat ggtaaataat gagatagtaa				1600

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atatgctgta acagatc

1617

&lt;210&gt; 84

&lt;211&gt; 3269

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (260)...(2209)

&lt;400&gt; 84

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agagtttccg caccgaggag ggagatgcgg ccggggctca ggctccttgc agttgtaatt      60
tagattcgag aagtgggtta tcctttgact ggaaaagaaa agtagctgca gtattccccc      120
agcacttget gagagcatgc cgtatgccag gctgtgaggg tcgagagaca agcagtggaa      180
gagttgcggc ctgtttcatc tctggattgt aaatctgagc ctcttcttgg cccttggaa      240
gggacagcat cacgatgga atg att cct aac cag cat aat gct gga gcc ggg      292
          Met Ile Pro Asn Gln His Asn Ala Gly Ala Gly
                1             5             10
agc cac caa cct gca gtt ttc aga atg gcc gtg ttg gac act gat ttg      340
Ser His Gln Pro Ala Val Phe Arg Met Ala Val Leu Asp Thr Asp Leu
                15             20             25
gat cac att ctt cca tct tct gtt ctt cct cca ttc tgg gct aag tta      388
Asp His Ile Leu Pro Ser Ser Val Leu Pro Pro Phe Trp Ala Lys Leu
                30             35             40
gta gtg gga tcg gtt gcc att gtg tgt ttt gca cgc agc tat gat gga      436
Val Val Gly Ser Val Ala Ile Val Cys Phe Ala Arg Ser Tyr Asp Gly
                45             50             55
gac ttt gtc ttt gat gac tca gaa gct att gtt aac aat aag gtt gct      484
Asp Phe Val Phe Asp Asp Ser Glu Ala Ile Val Asn Asn Lys Val Ala
                60             65             70             75
ggg gtt gtc ggc cgt gca gac ctc ctg tgt gcc ctg ttc ttc ttg tta      532
Gly Val Val Gly Arg Ala Asp Leu Leu Cys Ala Leu Phe Phe Leu Leu
                80             85             90
tct ttc ctt ggc tac tgt aaa gca ttt aga gaa agt aac aag gag gga      580
Ser Phe Leu Gly Tyr Cys Lys Ala Phe Arg Glu Ser Asn Lys Glu Gly
                95             100             105

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gcg cat tct tcc acc ttc tgg gtg ctg ctg agt atc ttt ctg gga gca	628
Ala His Ser Ser Thr Phe Trp Val Leu Leu Ser Ile Phe Leu Gly Ala	
110 115 120	
gtg gcc atg ctg tgc aaa gag caa ggg atc act gtg ctg ggt tta aat	676
Val Ala Met Leu Cys Lys Glu Gln Gly Ile Thr Val Leu Gly Leu Asn	
125 130 135	
gcg gta ttt gac atc ttg gtg ata ggc aaa ttc aat gtt ctg gaa att	724
Ala Val Phe Asp Ile Leu Val Ile Gly Lys Phe Asn Val Leu Glu Ile	
140 145 150 155	
gtc cag aag gta cta cat aag gac aag tca tta gag aat ctc ggc atg	772
Val Gln Lys Val Leu His Lys Asp Lys Ser Leu Glu Asn Leu Gly Met	
160 165 170	
ctc agg aac ggg ggc ctc ctc ttc aga atg acc ctg ctc acc tct gga	820
Leu Arg Asn Gly Gly Leu Leu Phe Arg Met Thr Leu Leu Thr Ser Gly	
175 180 185	
ggg gct ggg atg ctc tac gtg cgc tgg agg atc atg ggc acg ggc ccg	868
Gly Ala Gly Met Leu Tyr Val Arg Trp Arg Ile Met Gly Thr Gly Pro	
190 195 200	
ccg gcc ttc acc gag gtg gac aac ccg gcc tcc ttt gct gac agc atg	916
Pro Ala Phe Thr Glu Val Asp Asn Pro Ala Ser Phe Ala Asp Ser Met	
205 210 215	
ctg gtg agg gcc gta aac tac aat tac tac tat tca ttg aat gcc tgg	964
Leu Val Arg Ala Val Asn Tyr Asn Tyr Tyr Tyr Ser Leu Asn Ala Trp	
220 225 230 235	
ctg ctg ctg tgt ccc tgg tgg ctg tgt ttt gat tgg tca atg ggc tgc	1012
Leu Leu Leu Cys Pro Trp Trp Leu Cys Phe Asp Trp Ser Met Gly Cys	
240 245 250	
atc ccc ctc att aag tcc atc agc gac tgg agg gta att gca ctt gca	1060
Ile Pro Leu Ile Lys Ser Ile Ser Asp Trp Arg Val Ile Ala Leu Ala	
255 260 265	
gca ctc tgg ttc tgc cta att ggc ctg ata tgc caa gcc ctg tgc tct	1108
Ala Leu Trp Phe Cys Leu Ile Gly Leu Ile Cys Gln Ala Leu Cys Ser	
270 275 280	
gaa gac ggc cac aag aga agg atc ctt act ctg ggc ctg gga ttt ctc	1156
Glu Asp Gly His Lys Arg Arg Ile Leu Thr Leu Gly Leu Gly Phe Leu	

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285	290	295	
ggt atc cca ttt ctc ccc gcg agt aac ctg ttc ttc cga gtg ggc ttc			1204
Val Ile Pro Phe Leu Pro Ala Ser Asn Leu Phe Phe Arg Val Gly Phe			
300	305	310	315
gtg gtc gcg gag cgt gtc ctc tac ctc ccc agc att ggg tac tgt gtg			1252
Val Val Ala Glu Arg Val Leu Tyr Leu Pro Ser Ile Gly Tyr Cys Val			
320	325	330	
ctg ctg act ttt gga ttc gga gcc ctg agc aaa cat acc aag aaa aag			1300
Leu Leu Thr Phe Gly Phe Gly Ala Leu Ser Lys His Thr Lys Lys Lys			
335	340	345	
aaa ctc att gcc gct gtc gtg ctg gga atc tta ttc atc aac acg ctg			1348
Lys Leu Ile Ala Ala Val Val Leu Gly Ile Leu Phe Ile Asn Thr Leu			
350	355	360	
aga tgt gtg ctg cgc agc ggc gag tgg cgg agt gag gaa cag ctt ttc			1396
Arg Cys Val Leu Arg Ser Gly Glu Trp Arg Ser Glu Glu Gln Leu Phe			
365	370	375	
aga agt gct ctg tct gtg tgt ccc ctc aat gct aag gtt cac tac aac			1444
Arg Ser Ala Leu Ser Val Cys Pro Leu Asn Ala Lys Val His Tyr Asn			
380	385	390	395
att ggc aaa aac ctg gct gat aaa ggc aac cag aca gct gcc atc aga			1492
Ile Gly Lys Asn Leu Ala Asp Lys Gly Asn Gln Thr Ala Ala Ile Arg			
400	405	410	
tac tac cgg gaa gct gta aga tta aat ccc aag tat gtt cat gcc atg			1540
Tyr Tyr Arg Glu Ala Val Arg Leu Asn Pro Lys Tyr Val His Ala Met			
415	420	425	
aat aat ctt gga aat atc tta aaa gaa agg aat gag cta cag gaa gct			1588
Asn Asn Leu Gly Asn Ile Leu Lys Glu Arg Asn Glu Leu Gln Glu Ala			
430	435	440	
gag gag ctg ctg tct ttg gct gtt caa ata cag cca gac ttt gcc gct			1636
Glu Glu Leu Leu Ser Leu Ala Val Gln Ile Gln Pro Asp Phe Ala Ala			
445	450	455	
gcg tgg atg aat cta ggc ata gtg cag aat agc ctg aaa cgg ttt gaa			1684
Ala Trp Met Asn Leu Gly Ile Val Gln Asn Ser Leu Lys Arg Phe Glu			
460	465	470	475
gca gca gag caa agt tac cgg aca gca att aaa cac aga agg aaa tac			1732

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Ala Ala Glu Gln Ser Tyr Arg Thr Ala Ile Lys His Arg Arg Lys Tyr	
480 485 490	
cca gac tgt tac tac aac ctc ggg cgt ctg tat gca gat ctc aat cgc	1780
Pro Asp Cys Tyr Tyr Asn Leu Gly Arg Leu Tyr Ala Asp Leu Asn Arg	
495 500 505	
cac gtg gat gcc ttg aat gcg tgg aga aat gcc acc gtg ctg aaa cca	1828
His Val Asp Ala Leu Asn Ala Trp Arg Asn Ala Thr Val Leu Lys Pro	
510 515 520	
gag cac agc ctg gcc tgg aac aac atg att ata ctc ctc gac aat aca	1876
Glu His Ser Leu Ala Trp Asn Asn Met Ile Ile Leu Leu Asp Asn Thr	
525 530 535	
ggt aat tta gcc caa gct gaa gca gtt gga aga gag gca ctg gaa tta	1924
Gly Asn Leu Ala Gln Ala Glu Ala Val Gly Arg Glu Ala Leu Glu Leu	
540 545 550 555	
ata cct aat gat cac tct ctc atg ttc tgc ttg gca aac gtg ctg ggg	1972
Ile Pro Asn Asp His Ser Leu Met Phe Ser Leu Ala Asn Val Leu Gly	
560 565 570	
aaa tcc cag aaa tac aag gaa tct gaa gct tta ttc ctc aag gca att	2020
Lys Ser Gln Lys Tyr Lys Glu Ser Glu Ala Leu Phe Leu Lys Ala Ile	
575 580 585	
aaa gca aat cca aat gct gca agt tac cat ggt aat ttg gct gtg ctt	2068
Lys Ala Asn Pro Asn Ala Ala Ser Tyr His Gly Asn Leu Ala Val Leu	
590 595 600	
tat cat cgt tgg gga cat cta gac ttg gcc aag aaa cac tat gaa atc	2116
Tyr His Arg Trp Gly His Leu Asp Leu Ala Lys Lys His Tyr Glu Ile	
605 610 615	
tcc ttg cag ctt gac ccc acg gca tca gga act aag gag aat tac ggt	2164
Ser Leu Gln Leu Asp Pro Thr Ala Ser Gly Thr Lys Glu Asn Tyr Gly	
620 625 630 635	
ctg ctg aga aga aag cta gaa cta atg caa aag aaa gct gtc tgat	2210
Leu Leu Arg Arg Lys Leu Glu Leu Met Gln Lys Lys Ala Val	
640 645	
cctgtttcct tcatgttttg agtttgagtg tgtgtgtgca tgaggcatat cattaatagt	2270
atgtggttac atttaaccat ttaaaagtct tagacatggt attttactga tttttttcta	2330
tgaaaacaaa gacatgcaaa aagattatag caccagcaat atactcttga atgcgtgata	2390

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tgatTTTTca ttgaaattgt atTTTTtcag acaactcaaa tgtaattcta aaattccaaa 2450  
 aatgtctttt ttaattaaac agaaaaagag aaaaaattat cttgagcaac ttttagtaga 2510  
 attgagctta catttgggat ctgagcottg tcgtgtatgg actagcacta ttaaacttca 2570  
 attatgacca agaaaggata cactggcccc tacaatttgt ataaatattg aacatgtcta 2630  
 tatattagca tttttattta atgacaaagc aaattaagtt tttttatctc ttttttttaa 2690  
 aacaacatac tgtgaacttt gtaaggaaat atttatttgt atttttatgt tttgaatagg 2750  
 gcaaataatc gaatgaggaa tggaaagttt aacatagtat atctatatgc ttttcccat 2810  
 aggaagaaat tgactcttgc agtttttgga tgctctgact tgtgcaattt caatacacag 2870  
 gagattatgt aatgtaatat ttttcataag cggttactat caattgaaag ttcaagccat 2930  
 gctttaggca agagcaggca gcctcacatc tttatttttg ttacatccaa ggtgaagagg 2990  
 gcaacacatc tgtgtaagct gctttttagt gtgtttatct gaaggccgtt ttccattttg 3050  
 cttaatgtaa ctacagacat tatccagaaa atgcaaaatt ttctatcaaa tggagccaca 3110  
 ttcggggaat tcgttgtatt tttagaatt gagttgttcc tgctgttttt tatttgatcc 3170  
 aaacaatgtt ttgttttgtt cttctctgta tgctgttgac ctaatgattt atgcaatctc 3230  
 tgtaatttct tatgcagtaa aattactaca caaactage 3269

&lt;210&gt; 85

&lt;211&gt; 458

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (66)...(347)

&lt;400&gt; 85

acagttcctc tggacttctc tggaccacag tcctctgcc aacccctgcc agacccagtc 60  
 ccacc atg atc cat ctg ggt cac atc ctc ttc ctg ctt ttg ctc cca gtg 110  
 Met Ile His Leu Gly His Ile Leu Phe Leu Leu Leu Leu Pro Val  
 1 5 10 15  
 gct gca gct cag acg act cca gga gag aga tca tca ctc cct gcc ttt 158  
 Ala Ala Ala Gln Thr Thr Pro Gly Glu Arg Ser Ser Leu Pro Ala Phe  
 20 25 30  
 tac cct ggc act tca ggc tot tgt tcc gga tgt ggg tcc ctc tct ctg 206  
 Tyr Pro Gly Thr Ser Gly Ser Cys Ser Gly Cys Gly Ser Leu Ser Leu  
 35 40 45  
 ccg ctc ctg gca ggc ctc gtg gct gct gat gcg gtg gca tcg ctg ctc 254

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Pro Leu Leu Ala Gly Leu Val Ala Ala Asp Ala Val Ala Ser Leu Leu  
                   50                  55                  60  
 atc gtg ggg gcg gtg ttc ctg tgc gca cgc cca cgc cgc agc ccc gcc 302  
 Ile Val Gly Ala Val Phe Leu Cys Ala Arg Pro Arg Arg Ser Pro Ala  
                   65                  70                  75  
 caa gaa gat ggc aaa gtc tac atc aac atg cca ggc agg ggc tgaccc 350  
 Gln Glu Asp Gly Lys Val Tyr Ile Asn Met Pro Gly Arg Gly  
                   80                  85                  90  
 tcctgcagct tggacotttg acttctgacc ctctcatcct ggatggtgtg tgggtggcaca 410  
 ggaacccccg ccccaacttt tggattgtaa taaaacaatt gaaacacc 458

&lt;210&gt; 86

&lt;211&gt; 1712

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (180)...(1457)

&lt;400&gt; 86

tcccgctggc tagaagaagt cttcacttcc caggagagcc aaagcgtgtc tggccctagg 60  
 tgggaaaaga actggctgtg acctttgccc tgacctggaa gggcccagcc ttgggtgaa 120  
 tggcagcacc cagccccgcc cgtccggtgc tgacccacct gctggtgget ctcttcggc 179  
 atg ggc tcc tgg gct gcg gtc aat ggg atc tgg gtg gag cta cct gtg 227  
 Met Gly Ser Trp Ala Ala Val Asn Gly Ile Trp Val Glu Leu Pro Val  
                   1                  5                  10                  15  
 gtg gtc aaa gag ctt cca gag ggt tgg agc ctc ccc tct tac gtc tct 275  
 Val Val Lys Glu Leu Pro Glu Gly Trp Ser Leu Pro Ser Tyr Val Ser  
                   20                  25                  30  
 gtg ctt gtg gct ctg ggg aac ctg ggt ctg ctg gtg gtg acc ctc tgg 323  
 Val Leu Val Ala Leu Gly Asn Leu Gly Leu Leu Val Val Thr Leu Trp  
                   35                  40                  45  
 agg agg ctg gcc cca gga aag gac gag cag gtc ccc atc cgg gtg gtg 371  
 Arg Arg Leu Ala Pro Gly Lys Asp Glu Gln Val Pro Ile Arg Val Val  
                   50                  55                  60  
 cag gtg ctg ggc atg gtg ggc aca gcc ctg ctg gcc tct ctg tgg cac 419

Gln Val Leu Gly Met Val Gly Thr Ala Leu Leu Ala Ser Leu Trp His	
65                          70                          75                          80	
cat gtg gcc cca gtg gca gga cag ttg cat tct gtg gcc ttc tta gca	467
His Val Ala Pro Val Ala Gly Gln Leu His Ser Val Ala Phe Leu Ala	
85                          90                          95	
ctg gcc ttt gtg ctg gca ctg gca tgc tgt gcc tcg aat gtc act ttc	515
Leu Ala Phe Val Leu Ala Leu Ala Cys Cys Ala Ser Asn Val Thr Phe	
100                          105                          110	
ctg ccc ttc ttg agc cac ctg cca cct cgc ttc tta cgg tca ttc ttc	563
Leu Pro Phe Leu Ser His Leu Pro Pro Arg Phe Leu Arg Ser Phe Phe	
115                          120                          125	
ctg ggt caa ggc ctg agt gcc ctg ctg ccc tgc gtg ctg gcc cta gtg	611
Leu Gly Gln Gly Leu Ser Ala Leu Leu Pro Cys Val Leu Ala Leu Val	
130                          135                          140	
cag ggt gtg ggc cgc etc gag tgc ccg cca gcc ccc atc aac ggc acc	659
Gln Gly Val Gly Arg Leu Glu Cys Pro Pro Ala Pro Ile Asn Gly Thr	
145                          150                          155                          160	
cct ggc ccc ccg etc gac ttc ett gag cgt ttt ccc gcc age acc ttc	707
Pro Gly Pro Pro Leu Asp Phe Leu Glu Arg Phe Pro Ala Ser Thr Phe	
165                          170                          175	
tte tgg gca ctg act gcc ett ctg gtc get tca got got gcc ttc cag	755
Phe Trp Ala Leu Thr Ala Leu Leu Val Ala Ser Ala Ala Ala Phe Gln	
180                          185                          190	
ggt ett ctg ctg ctg ttg ccg cca cca cca tct gta ccc aca ggg gag	803
Gly Leu Leu Leu Leu Leu Pro Pro Pro Pro Ser Val Pro Thr Gly Glu	
195                          200                          205	
tta gga tca ggc etc cag gtg gga gcc cca gga gca gag gaa gag gtg	851
Leu Gly Ser Gly Leu Gln Val Gly Ala Pro Gly Ala Glu Glu Glu Val	
210                          215                          220	
gaa gag toc tca cca ctg caa gag cca cca age cag gca gca ggc acc	899
Glu Glu Ser Ser Pro Leu Gln Glu Pro Pro Ser Gln Ala Ala Gly Thr	
225                          230                          235                          240	
acc cct ggt cca gac cct aag gcc tat cag ett cta tca gcc cgc agt	947
Thr Pro Gly Pro Asp Pro Lys Ala Tyr Gln Leu Leu Ser Ala Arg Ser	
245                          250                          255	

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gcc tgc ctg ctg ggc ctg ttg gcc gcc acc aac gcg ctg acc aat ggc	995
Ala Cys Leu Leu Gly Leu Leu Ala Ala Thr Asn Ala Leu Thr Asn Gly	
260 265 270	
gtg ctg cct gcc gtg cag agc ttt tcc tgc tta ccc tac ggg cgt ctg	1043
Val Leu Pro Ala Val Gln Ser Phe Ser Cys Leu Pro Tyr Gly Arg Leu	
275 280 285	
gcc tac cac ctg gct gtg gtg ctg ggc agt gct gcc aat ccc ctg gcc	1091
Ala Tyr His Leu Ala Val Val Leu Gly Ser Ala Ala Asn Pro Leu Ala	
290 295 300	
tgc ttc ctg gcc atg ggt gtg ctg tgc agg tcc ttg gca ggg ctg ggc	1139
Cys Phe Leu Ala Met Gly Val Leu Cys Arg Ser Leu Ala Gly Leu Gly	
305 310 315 320	
ggc ctc tct ctg ctg ggc gtg ttc tgt ggg ggc tac ctg atg gcg ctg	1187
Gly Leu Ser Leu Leu Gly Val Phe Cys Gly Gly Tyr Leu Met Ala Leu	
325 330 335	
gca gtc ctg agc ccc tgc ccg ccc ctg gtg ggc acc tcg gcg ggg gtg	1235
Ala Val Leu Ser Pro Cys Pro Pro Leu Val Gly Thr Ser Ala Gly Val	
340 345 350	
gtc ctc gtg gtg ctg tcg tgg gtg ctg tgt ctt ggc gtg ttc tcc tac	1283
Val Leu Val Val Leu Ser Trp Val Leu Cys Leu Gly Val Phe Ser Tyr	
355 360 365	
gtg aag gtg gca gcc agc tcc ctg ctg cat ggc ggg ggc cgg ccg gca	1331
Val Lys Val Ala Ala Ser Ser Leu Leu His Gly Gly Gly Arg Pro Ala	
370 375 380	
ttg ctg gca gcc ggc gtg gcc atc cag gtg ggc tct ctg ctc ggc gct	1379
Leu Leu Ala Ala Gly Val Ala Ile Gln Val Gly Ser Leu Leu Gly Ala	
385 390 395 400	
gtt gct atg ttc ccc ccg acc agc atc tat cac gtg ttc cac agc aga	1427
Val Ala Met Phe Pro Pro Thr Ser Ile Tyr His Val Phe His Ser Arg	
405 410 415	
aag gac tgt gca gac ccc tgt gac tcc tgagcctggg caggtgggga ccccg	1480
Lys Asp Cys Ala Asp Pro Cys Asp Ser	
420 425	
tccccaacac ctgtctttcc ctcaatgctg ccaccatgcc tgagtgcctg cagcccagga	1540
ggcccgacac ccgtacact cgtggacacc tacacactcc ataggagatc ctggctttcc	1600

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aggggtgggca agggcaagga gcaggcttgg agccagggac cagtgggggc tgtagggtaa 1660  
 gccctgagc ctgggaccta catgtggttt gcgtaataaa acatttgat tt 1712

&lt;210&gt; 87

&lt;211&gt; 1055

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (53)...(502)

&lt;400&gt; 87

accgggagggc gcgtggggct tgaggccgag aacggccctt gctgccacca ac atg 55

Met

1

gag act ttg tac cgt gtc ccg ttc tta gtg ctc gaa tgt ccc aac ctg 103

Glu Thr Leu Tyr Arg Val Pro Phe Leu Val Leu Glu Cys Pro Asn Leu

5

10

15

aag ctg aag aag ccg ccc tgg ttg cac atg ccg tcg gcc atg act gtg 151

Lys Leu Lys Lys Pro Pro Trp Leu His Met Pro Ser Ala Met Thr Val

20

25

30

tat gct ctg gtg gtg gtg tct tac ttc ctc atc acc gga gga ata att 199

Tyr Ala Leu Val Val Val Ser Tyr Phe Leu Ile Thr Gly Gly Ile Ile

35

40

45

tat gat gtt att gtt gaa cct cca agt gtc ggt tct atg act gat gaa 247

Tyr Asp Val Ile Val Glu Pro Pro Ser Val Gly Ser Met Thr Asp Glu

50

55

60

65

cat ggg cat cag agg cca gta gct ttc ttg gcc tac aga gta aat gga 295

His Gly His Gln Arg Pro Val Ala Phe Leu Ala Tyr Arg Val Asn Gly

70

75

80

caa tat att atg gaa gga ctt gca tcc agc ttc cta ttt aca atg gga 343

Gln Tyr Ile Met Glu Gly Leu Ala Ser Ser Phe Leu Phe Thr Met Gly

85

90

95

ggg tta ggt ttc ata atc ctg gac cga tcg aat gca cca aat atc cca 391

Gly Leu Gly Phe Ile Ile Leu Asp Arg Ser Asn Ala Pro Asn Ile Pro

100

105

110



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aaa ctc aat aga ttc ctt ctt ctg ttc att gga ttc gtc tgt gtc cta 439  
 Lys Leu Asn Arg Phe Leu Leu Leu Phe Ile Gly Phe Val Cys Val Leu  
 115 120 125  
 ttg agt ttt ttc atg gct aga gta ttc atg aga atg aaa ctg ccg ggc 487  
 Leu Ser Phe Phe Met Ala Arg Val Phe Met Arg Met Lys Leu Pro Gly  
 130 135 140 145  
 tat ctg atg ggt tagagtgcct ttgagaagaa atcagtggat actggatttg c 540  
 Tyr Leu Met Gly

tcctgtcaat gaagttttaa aggotgtacc aatcctctaa tatgaaatgt ggaaaagaat 600  
 gaagagcagc agtaaaagaa atatctagtg aaaaaacagg aagcgtattg aagcttggac 660  
 tagaatttct tcttggtatt aaagagacaa gtttatcaca gaattttttt tcctgctggc 720  
 ctattgctat accaatgatg ttgagtggca ttttcttttt agtttttcat taaaatatat 780  
 tccatatcta caactataat atcaaataaa gtgattattt tttacaaccc tottaacatt 840  
 ttttgagat gacatttctg attttcagaa attaacataa aatccagaag caagattccg 900  
 taagctgaga actctggaca gttgatoagc tttacctatg gtgctttgcc ttttaactaga 960  
 gtgtgtgatg gtagattatt tcagatatgt atgtaaaact gtttctgaa caataagatg 1020  
 tatgaacgga gcagaaataa atactttttc taatt 1055

&lt;210&gt; 88

&lt;211&gt; 1616

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (222)...(1412)

&lt;400&gt; 88

gagctctcac gggtttcctct ttcttgacaa aaagaatatt aatgaaactt tatcatcttg 60  
 gtgagaaaag cattctaata gctttattct gacatacgga ggtatggaga gottgaagga 120  
 gtcagagagg tgcccagcta agacctgaat gccatcacc tccccagggc totgcagttt 180  
 tctcgtggtg aacccttgat ggatttgttg ttgcttgaga a atg gcg atg atc 233  
 Met Ala Met Ile

1

gaa ttg ggg ttt gga aga cag aat ttt cat cca tta aag agg aag agt 281  
 Glu Leu Gly Phe Gly Arg Gln Asn Phe His Pro Leu Lys Arg Lys Ser

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5	10	15	20	
tca ttg ctg ttg aaa ctc ata gct gtt gtc ttt gct gtg ctt cta ttt				329
Ser Leu Leu Leu Lys Leu Ile Ala Val Val Phe Ala Val Leu Leu Phe				
25	30	35		
tgt gaa ttt tta atc tat tac tta gcg atc ttt cag tgt aat tgg cct				377
Cys Glu Phe Leu Ile Tyr Tyr Leu Ala Ile Phe Gln Cys Asn Trp Pro				
40	45	50		
gaa gtg aaa acc aca gcc tct gat ggt gaa cag acc aca cgt gag cct				425
Glu Val Lys Thr Thr Ala Ser Asp Gly Glu Gln Thr Thr Arg Glu Pro				
55	60	65		
gtg ctc aaa gcc atg ttt ttg gct gac acc cat ttg ctt ggg gaa ttc				473
Val Leu Lys Ala Met Phe Leu Ala Asp Thr His Leu Leu Gly Glu Phe				
70	75	80		
cta ggc cac tgg ctg gac aaa tta cga agg gaa tgg cag atg gag aga				521
Leu Gly His Trp Leu Asp Lys Leu Arg Arg Glu Trp Gln Met Glu Arg				
85	90	95	100	
gcg ttc cag aca gct ctg tgg ttg ctg cag ccg gaa gtc gtc ttc atc				569
Ala Phe Gln Thr Ala Leu Trp Leu Leu Gln Pro Glu Val Val Phe Ile				
105	110	115		
ctg ggg gat atc ttt gat gaa ggg aag tgg agc acc cct gag gcc tgg				617
Leu Gly Asp Ile Phe Asp Glu Gly Lys Trp Ser Thr Pro Glu Ala Trp				
120	125	130		
gcg gat gat gtg gag cgg ttt cag aaa atg ttc aga cac cca agt cat				665
Ala Asp Asp Val Glu Arg Phe Gln Lys Met Phe Arg His Pro Ser His				
135	140	145		
gta cag ctg aag gta gtt gct gga aac cat gac att ggc ttc cat tat				713
Val Gln Leu Lys Val Val Ala Gly Asn His Asp Ile Gly Phe His Tyr				
150	155	160		
gag atg aac aca tac aaa gta gaa cgc ttt gag aaa gtg ttc agc tct				761
Glu Met Asn Thr Tyr Lys Val Glu Arg Phe Glu Lys Val Phe Ser Ser				
165	170	175	180	
gaa aga ctg ttt tct tgg aaa ggc att aac ttt gtg atg gtc aac agc				809
Glu Arg Leu Phe Ser Trp Lys Gly Ile Asn Phe Val Met Val Asn Ser				
185	190	195		
gtg gcg ctg aac ggg gat ggc tgt ggc atc tgc tct gaa aca gaa gca				857

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Val Ala Leu Asn Gly Asp Gly Cys Gly Ile Cys Ser Glu Thr Glu Ala	
200 205 210	
gag ctc att gaa gtt tct cac aga ctg aac tgc tcc cga gag gca cgt	905
Glu Leu Ile Glu Val Ser His Arg Leu Asn Cys Ser Arg Glu Ala Arg	
215 220 225	
ggc tcc agc cgg tgt gga cct ggg cct ctg ctg ccc acg tct gcc cct	953
Gly Ser Ser Arg Cys Gly Pro Gly Pro Leu Leu Pro Thr Ser Ala Pro	
230 235 240	
gtc ctc ctg cag cat tat cct ctg tat cgg aga agt gat gct aac tgt	1001
Val Leu Leu Gln His Tyr Pro Leu Tyr Arg Arg Ser Asp Ala Asn Cys	
245 250 255 260	
tct ggg gaa gac gct gct cct gca gag gaa agg gac atc cca ttt aag	1049
Ser Gly Glu Asp Ala Ala Pro Ala Glu Glu Arg Asp Ile Pro Phe Lys	
265 270 275	
gag aac tat gac gtg ctt tca cgg gag gca tca caa aag ctg ctg tgg	1097
Glu Asn Tyr Asp Val Leu Ser Arg Glu Ala Ser Gln Lys Leu Leu Trp	
280 285 290	
tgg ctc cag ccg cgc ctg gtt ctc agt ggc cac acg cac agc gcc tgc	1145
Trp Leu Gln Pro Arg Leu Val Leu Ser Gly His Thr His Ser Ala Cys	
295 300 305	
gag gtg cac cac ggg ggc cga gtc ccc gag ctc agc gtc cca tct ttc	1193
Glu Val His His Gly Gly Arg Val Pro Glu Leu Ser Val Pro Ser Phe	
310 315 320	
agt tgg agg aac aga aac aac ccc agt ttc atc atg ggt agc atc acg	1241
Ser Trp Arg Asn Arg Asn Asn Pro Ser Phe Ile Met Gly Ser Ile Thr	
325 330 335 340	
ccc aca gac tac acc ctc tcc aag tgc tac ctc cca cgt gag gat gtg	1289
Pro Thr Asp Tyr Thr Leu Ser Lys Cys Tyr Leu Pro Arg Glu Asp Val	
345 350 355	
gtt ttg atc atc tac tgt gga gtg gtg ggc ttc ctt gtg gtc ctc aca	1337
Val Leu Ile Ile Tyr Cys Gly Val Val Gly Phe Leu Val Val Leu Thr	
360 365 370	
ctc act cac ttt ggg ctt cta gcc tca cct ttt ctt tct ggt ttg aac	1385
Leu Thr His Phe Gly Leu Leu Ala Ser Pro Phe Leu Ser Gly Leu Asn	
375 380 385	

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ttg ctc gga aag cgt aag aca aga tgaagagcag gcgccattat a 1430  
 Leu Leu Gly Lys Arg Lys Thr Arg

390

395

aatatcaaag cccaagaaat ggaactttgg gcagagatca tgtagaatc aagtggatga 1490  
 tgagaccaat tacaggccgt ctctctgcac agcacagaaa ttctcaatca ctgaaatgag 1550  
 taactgcaaa ataaatagtt gattgtactg ttctcatgct ataaaagtgg acaggtactc 1610  
 tacaac 1616

&lt;210&gt; 89

&lt;211&gt; 1860

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (69)...(1121)

&lt;400&gt; 89

gagaagtgtc gcgtccgtgc gccgcggggt ggggcgggtc caggtgtgcc gaagctctgg 60

tcagtgcc atg atc cgg cag gag cgc tcc aca tcc tac cag gag ctg 107

Met Ile Arg Gln Glu Arg Ser Thr Ser Tyr Gln Glu Leu

1

5

10

agt gag gag ttg gtc cag gtg gtt gag aac tca gag ctg gca gac gag 155

Ser Glu Glu Leu Val Gln Val Val Glu Asn Ser Glu Leu Ala Asp Glu

15

20

25

cag gac aag gag acg gtc aga gtc caa ggt ccg ggt atc tta cca ggc 203

Gln Asp Lys Glu Thr Val Arg Val Gln Gly Pro Gly Ile Leu Pro Gly

30

35

40

45

ctg gac agc gag tcc gcc tcc agc agc atc cgc ttc agc aag gcc tgc 251

Leu Asp Ser Glu Ser Ala Ser Ser Ser Ile Arg Phe Ser Lys Ala Cys

50

55

60

ctg aag aac gtc ttc tcg gtc cta ctc atc ttc atc tac ctg ctg ctc 299

Leu Lys Asn Val Phe Ser Val Leu Leu Ile Phe Ile Tyr Leu Leu Leu

65

70

75

atg gct gtg gcc gtc ttc ctg gtc tac cgg acc atc aca gac ttt cgt 347

Met Ala Val Ala Val Phe Leu Val Tyr Arg Thr Ile Thr Asp Phe Arg

80

85

90

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gag aaa ctc aag cac cct gtc atg tct gtg tct tac aag gaa gtg gat	395
Glu Lys Leu Lys His Pro Val Met Ser Val Ser Tyr Lys Glu Val Asp	
95 100 105	
cgc tat gat gcc cca ggt att gcc ttg tac ccc ggt cag gcc cag ttg	443
Arg Tyr Asp Ala Pro Gly Ile Ala Leu Tyr Pro Gly Gln Ala Gln Leu	
110 115 120 125	
ctc agc tgt aag cac cat tac gag gtc att cct cct ctg aca agc cct	491
Leu Ser Cys Lys His His Tyr Glu Val Ile Pro Pro Leu Thr Ser Pro	
130 135 140	
ggc cag ccg ggt gac atg aat tgc acc acc cag agg atc aac tac acg	539
Gly Gln Pro Gly Asp Met Asn Cys Thr Thr Gln Arg Ile Asn Tyr Thr	
145 150 155	
gac ccc ttc tcc aat cag act gtg aaa tct gcc ctg att gtc cag ggg	587
Asp Pro Phe Ser Asn Gln Thr Val Lys Ser Ala Leu Ile Val Gln Gly	
160 165 170	
ccc cgg gaa gtg aaa aag cgg gag ctg gtc ttc ctc cag ttc cgc ctg	635
Pro Arg Glu Val Lys Lys Arg Glu Leu Val Phe Leu Gln Phe Arg Leu	
175 180 185	
aac aag agt agt gag gac ttc agc gcc att gat tac ctc ctc ttc tot	683
Asn Lys Ser Ser Glu Asp Phe Ser Ala Ile Asp Tyr Leu Leu Phe Ser	
190 195 200 205	
tct ttc cag gag ttc ctg caa agc cca aac agg gta ggc ttc atg cag	731
Ser Phe Gln Glu Phe Leu Gln Ser Pro Asn Arg Val Gly Phe Met Gln	
210 215 220	
gcc tgt gag agt gcc tat tcc agc tgg aag ttc tct ggg ggc ttc cgc	779
Ala Cys Glu Ser Ala Tyr Ser Ser Trp Lys Phe Ser Gly Gly Phe Arg	
225 230 235	
acc tgg gtc aag atg tca ctg gta aag acc aag gag gag gat ggg cgg	827
Thr Trp Val Lys Met Ser Leu Val Lys Thr Lys Glu Glu Asp Gly Arg	
240 245 250	
gaa gca gtg gag ttc cgg cag gag aca agt gtg gtt aac tac att gac	875
Glu Ala Val Glu Phe Arg Gln Glu Thr Ser Val Val Asn Tyr Ile Asp	
255 260 265	
cag agg cca gct gcc aaa aaa agt gct caa ttg ttt ttt gtg gtc ttt	923
Gln Arg Pro Ala Ala Lys Lys Ser Ala Gln Leu Phe Phe Val Val Phe	

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270	275	280	285	
gaa tgg aaa gat cct ttc atc cag aaa gtc caa gat ata gtc act gcc				971
Glu Trp Lys Asp Pro Phe Ile Gln Lys Val Gln Asp Ile Val Thr Ala				
	290	295	300	
aat cct tgg aac aca att gct ctt ctc tgt ggc gcc ttc ttg gca tta				1019
Asn Pro Trp Asn Thr Ile Ala Leu Leu Cys Gly Ala Phe Leu Ala Leu				
	305	310	315	
ttt aaa gca gca gag ttt gcc aaa ctg agt ata aaa tgg atg atc aaa				1067
Phe Lys Ala Ala Glu Phe Ala Lys Leu Ser Ile Lys Trp Met Ile Lys				
	320	325	330	
att aga aag aga tac ctt aaa aga aga ggt cag gca acg agc cac ata				1115
Ile Arg Lys Arg Tyr Leu Lys Arg Arg Gly Gln Ala Thr Ser His Ile				
	335	340	345	
agc tgaagtcacc tcgcgttggt tagagaactg tccacatcaa tgggagctgt ca				1170
Ser				
350				
tcacttcac tttgtaaacg gagctatcaa caatcctgta ctcaattgaa gaaatggggc				1230
cttgctggga ggaacagcat gtaaaactgg aacttctaac cccgtcccaa aagaggcggg				1290
gtagagccta atagaagaga ctaatggata aacctacaag ttattttaa atttaaatta				1350
ttaataaact ttttaaagag ctggccaatg acttttgaat aggggttgta gaagatgcct				1410
ttcttcctgt ttggttcatt gtattgtatt aggttaagct ctactagggt aatgaaggct				1470
ctacttttca ctttttaaaa gtggacaaaa gagtgtgatt ttctttttcc aaaaattcct				1530
gagtatcaag acgtgcagggt catgctttgg agcctatgca ctgtacacaa aggcaaaacc				1590
ctatgacttt ggcacatctt gccattgatg tccagcctct gacatgetct ttgatttggt				1650
aatgtttaa tgagacttta aggcactag aaactagtaa ttaagtttct taatggactg				1710
agtagccacc tacttgccg gctagaatgt ttgttgatgt atgagtttag attaacactc				1770
aaaagcacta ggacagatgt acatagaagg tgcctactca ttgtattttg atgatttcat				1830
taacaggtaa ataaaagta atacaaaagg				1860

&lt;210&gt; 90

&lt;211&gt; 783

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

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&lt;222&gt; (245)...(706)

&lt;400&gt; 90

acacacccag tgaggtctct ggagccgcgg tgcgggaagc ggggacccgg gtttgaatcc	60
tgccctctg gtgtggtgag gcctcttccc acagactttt ggctcagtg tccccgcct	120
gggaagtggg gactggccct ggtacctggc tccagagctg caccacagagg cgatcagccc	180
ggtgcgggaa cggggcgggg tggccgcaac tacgggccac ggatcctgac cgcacctgcc	240
cacg atg act atc cac atc ctc atc ctg ctg ttg ctc ctc gcc ttc	286
Met Thr Ile His Ile Leu Ile Leu Leu Leu Leu Ala Phe	
1 5 10	
tcc gcc caa ggg gac ctg gac act gca gcc agg cga ggc cag cac cag	334
Ser Ala Gln Gly Asp Leu Asp Thr Ala Ala Arg Arg Gly Gln His Gln	
15 20 25 30	
gtc ccc cag cac cgc ggg cac gtc tgc tac ctg ggc gta tgc cgg acc	382
Val Pro Gln His Arg Gly His Val Cys Tyr Leu Gly Val Cys Arg Thr	
35 40 45	
cac cgc ctg gcg gag atc ata tac tgg att cgc tgt ctc cac caa gga	430
His Arg Leu Ala Glu Ile Ile Tyr Trp Ile Arg Cys Leu His Gln Gly	
50 55 60	
gcc ctc ggg gaa ggc cag cca cga gcc cca gga ccc cta cag cta tgg	478
Ala Leu Gly Glu Gly Gln Pro Arg Ala Pro Gly Pro Leu Gln Leu Trp	
65 70 75	
gcg ccg ccg gtg gcg cga ggc gga agc ccg gct cgg ttc cca gga ttc	526
Ala Pro Pro Val Ala Arg Gly Gly Ser Pro Ala Arg Phe Pro Gly Phe	
80 85 90	
cgg cct gca gcg agg ggg cta gcg cag tgc cca gct cgc tgg gtg acc	574
Arg Pro Ala Ala Arg Gly Leu Ala Gln Cys Pro Ala Arg Trp Val Thr	
95 100 105 110	
tcg ggc acg gct cgt ccc ctc ctc ggc ttc agt ttg cct atc tgt atg	622
Ser Gly Thr Ala Arg Pro Leu Leu Gly Phe Ser Leu Pro Ile Cys Met	
115 120 125	
ttg gag ctt cta ctc cac att tct tct ccc cta act cca gcc cct gaa	670
Leu Glu Leu Leu Leu His Ile Ser Ser Pro Leu Thr Pro Ala Pro Glu	
130 135 140	
acc gtc ttc ccc agt ccc tcc ccg ggc tgc gac taggttgag ctagaag	720
Thr Val Phe Pro Ser Pro Ser Pro Gly Cys Asp	

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145 150  
 cacacgggac caggctgggc gaagaacact gacgccccaga gccgaataaa caagagttcc 780  
 gtg 783

&lt;210&gt; 91

&lt;211&gt; 303

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 91

Met Glu Ala Glu Gln Arg Pro Ala Ala Gly Ala Ser Glu Gly Ala Thr  
 1 5 10 15  
 Pro Gly Leu Glu Ala Val Pro Pro Val Ala Pro Pro Pro Ala Thr Ala  
 20 25 30  
 Ala Ser Gly Pro Ile Pro Lys Ser Gly Pro Glu Pro Lys Arg Arg His  
 35 40 45  
 Leu Gly Thr Leu Leu Gln Pro Thr Val Asn Lys Phe Ser Leu Arg Val  
 50 55 60  
 Phe Gly Ser His Lys Ala Val Glu Ile Glu Gln Glu Arg Val Lys Ser  
 65 70 75 80  
 Ala Gly Ala Trp Ile Ile His Pro Tyr Ser Asp Phe Arg Phe Tyr Trp  
 85 90 95  
 Asp Leu Ile Met Leu Leu Leu Met Val Gly Asn Leu Ile Val Leu Pro  
 100 105 110  
 Val Gly Ile Thr Phe Phe Lys Glu Glu Asn Ser Pro Pro Trp Ile Val  
 115 120 125  
 Phe Asn Val Leu Ser Asp Thr Phe Phe Leu Leu Asp Leu Val Leu Asn  
 130 135 140  
 Phe Arg Thr Gly Ile Val Val Glu Glu Gly Ala Glu Ile Leu Leu Ala  
 145 150 155 160  
 Pro Arg Ala Ile Arg Thr Arg Tyr Leu Arg Thr Trp Phe Leu Val Asp  
 165 170 175  
 Leu Ile Ser Ser Ile Pro Val Asp Tyr Ile Phe Leu Val Val Glu Leu  
 180 185 190  
 Glu Pro Arg Leu Asp Ala Glu Val Tyr Lys Thr Ala Arg Ala Leu Arg  
 195 200 205



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Ile Val Arg Phe Thr Lys Ile Leu Ser Leu Leu Arg Leu Leu Arg Leu  
 210 215 220  
 Ser Arg Leu Ile Arg Tyr Ile His Gln Trp Glu Glu Ile Phe His Met  
 225 230 235 240  
 Thr Tyr Asp Leu Ala Ser Ala Val Val Arg Ile Phe Asn Leu Ile Gly  
 245 250 255  
 Met Met Leu Leu Leu Cys His Trp Asp Gly Cys Leu Gln Phe Leu Val  
 260 265 270  
 Pro Met Leu Gln Asp Phe Pro Pro Asp Cys Trp Val Ser Ile Asn His  
 275 280 285  
 Met Val Val Arg Ser Pro His Ser Ser Ala Phe Pro Gly Pro Ser  
 290 295 300

&lt;210&gt; 92

&lt;211&gt; 283

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 92

Met Ala Asp Pro His Gln Leu Phe Asp Asp Thr Ser Ser Ala Gln Ser  
 1 5 10 15  
 Arg Gly Tyr Gly Ala Gln Arg Ala Pro Gly Gly Leu Ser Tyr Pro Ala  
 20 25 30  
 Ala Ser Pro Thr Pro His Ala Ala Phe Leu Ala Asp Pro Val Ser Asn  
 35 40 45  
 Met Ala Met Ala Tyr Gly Ser Ser Leu Ala Ala Gln Gly Lys Glu Leu  
 50 55 60  
 Val Asp Lys Asn Ile Asp Arg Phe Ile Pro Ile Thr Lys Leu Lys Tyr  
 65 70 75 80  
 Tyr Phe Ala Val Asp Thr Met Tyr Val Gly Arg Lys Leu Gly Leu Leu  
 85 90 95  
 Phe Phe Pro Tyr Leu His Gln Asp Trp Glu Val Gln Tyr Gln Gln Asp  
 100 105 110  
 Thr Pro Val Ala Pro Arg Phe Asp Val Asn Ala Pro Asp Leu Tyr Ile  
 115 120 125  
 Pro Ala Met Ala Phe Ile Thr Tyr Val Leu Val Ala Gly Leu Ala Leu

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130	135	140
Gly Thr Gln Asp Arg Phe Ser Pro Asp Leu Leu Gly Leu Gln Ala Ser		
145	150	155
Ser Ala Leu Ala Trp Leu Thr Leu Glu Val Leu Ala Ile Leu Leu Ser		160
	165	170
Leu Tyr Leu Val Thr Val Asn Thr Asp Leu Thr Thr Ile Asp Leu Val		175
	180	185
Ala Phe Leu Gly Tyr Lys Tyr Val Gly Met Ile Gly Gly Val Leu Met		190
	195	200
Gly Leu Leu Phe Gly Lys Ile Gly Tyr Tyr Leu Val Leu Gly Trp Cys		205
	210	215
Cys Val Ala Ile Phe Val Phe Met Ile Arg Thr Leu Arg Leu Lys Ile		220
225	230	235
Leu Ala Asp Ala Ala Ala Glu Gly Val Pro Val Arg Gly Ala Arg Asn		240
	245	250
Gln Leu Arg Met Tyr Leu Thr Met Ala Val Ala Ala Ala Gln Pro Met		255
	260	265
Leu Met Tyr Trp Leu Thr Phe His Leu Val Arg		270
	275	280

&lt;210&gt; 93

&lt;211&gt; 488

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 93

Met Ala Gly Lys Gly Ser Ser Gly Arg Arg Pro Leu Leu Leu Gly Leu
1 5 10 15
Leu Val Ala Val Ala Thr Val His Leu Val Ile Cys Pro Tyr Thr Lys
20 25 30
Val Glu Glu Ser Phe Asn Leu Gln Ala Thr His Asp Leu Leu Tyr His
35 40 45
Trp Gln Asp Leu Glu Gln Tyr Asp His Leu Glu Phe Pro Gly Val Val
50 55 60
Pro Arg Thr Phe Leu Gly Pro Val Val Ile Ala Val Phe Ser Ser Pro
65 70 75 80

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Ala Val Tyr Val Leu Ser Leu Leu Glu Met Ser Lys Phe Tyr Ser Gln  
                     85                    90                    95  
 Leu Ile Val Arg Gly Val Leu Gly Leu Gly Val Ile Phe Gly Leu Trp  
                     100                    105                    110  
 Thr Leu Gln Lys Glu Val Arg Arg His Phe Gly Ala Met Val Ala Thr  
                     115                    120                    125  
 Met Phe Cys Trp Val Thr Ala Met Gln Phe His Leu Met Phe Tyr Cys  
                     130                    135                    140  
 Thr Arg Thr Leu Pro Asn Val Leu Ala Leu Pro Val Val Leu Leu Ala  
 145                    150                    155                    160  
 Leu Ala Ala Trp Leu Arg His Glu Trp Ala Arg Phe Ile Trp Leu Ser  
                     165                    170                    175  
 Ala Phe Ala Ile Ile Val Phe Arg Val Glu Leu Cys Leu Phe Leu Gly  
                     180                    185                    190  
 Leu Leu Leu Leu Leu Ala Leu Gly Asn Arg Lys Val Ser Val Val Arg  
                     195                    200                    205  
 Ala Leu Arg His Ala Val Pro Ala Gly Ile Leu Cys Leu Gly Leu Thr  
                     210                    215                    220  
 Val Ala Val Asp Ser Tyr Phe Trp Arg Gln Leu Thr Trp Pro Glu Gly  
 225                    230                    235                    240  
 Lys Val Leu Trp Tyr Asn Thr Val Leu Asn Lys Ser Ser Asn Trp Gly  
                     245                    250                    255  
 Thr Ser Pro Leu Leu Trp Tyr Phe Tyr Ser Ala Leu Pro Arg Gly Leu  
                     260                    265                    270  
 Gly Cys Ser Leu Leu Phe Ile Pro Leu Gly Leu Val Asp Arg Arg Thr  
                     275                    280                    285  
 His Ala Pro Thr Val Leu Ala Leu Gly Phe Met Ala Leu Tyr Ser Leu  
                     290                    295                    300  
 Leu Pro His Lys Glu Leu Arg Phe Ile Ile Tyr Ala Phe Pro Met Leu  
 305                    310                    315                    320  
 Asn Ile Thr Ala Ala Arg Gly Cys Ser Tyr Leu Leu Asn Asn Tyr Lys  
                     325                    330                    335  
 Lys Ser Trp Leu Tyr Lys Ala Gly Ser Leu Leu Val Ile Gly His Leu  
                     340                    345                    350  
 Val Val Asn Ala Ala Tyr Ser Ala Thr Ala Leu Tyr Val Ser His Phe

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355                      360                      365  
 Asn Tyr Pro Gly Gly Val Ala Met Gln Arg Leu His Gln Leu Val Pro  
 370                      375                      380  
 Pro Gln Thr Asp Val Leu Leu His Ile Asp Val Ala Ala Ala Gln Thr  
 385                      390                      395                      400  
 Gly Val Ser Arg Phe Leu Gln Val Asn Ser Ala Trp Arg Tyr Asp Lys  
                          405                      410                      415  
 Arg Glu Asp Val Gln Pro Gly Thr Gly Met Leu Ala Tyr Thr His Ile  
                          420                      425                      430  
 Leu Met Glu Ala Ala Pro Gly Leu Leu Ala Leu Tyr Arg Asp Thr His  
                          435                      440                      445  
 Arg Val Leu Ala Ser Val Val Gly Thr Thr Gly Val Ser Leu Asn Leu  
                          450                      455                      460  
 Thr Gln Leu Pro Pro Phe Asn Val His Leu Gln Thr Lys Leu Val Leu  
 465                      470                      475                      480  
 Leu Glu Arg Leu Pro Arg Pro Ser  
                          485

&lt;210&gt; 94

&lt;211&gt; 182

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 94

Met Trp Pro Pro Asp Pro Asp Pro Asp Pro Asp Pro Glu Pro Ala Gly  
                          1                      5                      10                      15  
 Gly Ser Arg Pro Gly Pro Ala Val Pro Gly Leu Arg Ala Leu Leu Pro  
                          20                      25                      30  
 Ala Arg Ala Phe Leu Cys Ser Leu Lys Gly Arg Leu Leu Leu Ala Glu  
                          35                      40                      45  
 Ser Gly Leu Ser Phe Ile Thr Phe Ile Cys Tyr Val Ala Ser Ser Ala  
                          50                      55                      60  
 Ser Ala Phe Leu Thr Ala Pro Leu Leu Glu Phe Leu Leu Ala Leu Tyr  
                          65                      70                      75                      80  
 Phe Leu Phe Ala Asp Ala Met Gln Leu Asn Asp Lys Trp Gln Gly Leu  
                          85                      90                      95

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Cys Trp Pro Met Met Asp Phe Leu Arg Cys Val Thr Ala Ala Leu Ile  
                   100                  105                  110  
 Tyr Phe Ala Ile Ser Ile Thr Ala Ile Ala Lys Tyr Ser Asp Gly Ala  
                   115                  120                  125  
 Ser Lys Ala Ala Gly Val Phe Gly Phe Phe Ala Thr Ile Val Phe Ala  
                   130                  135                  140  
 Thr Asp Phe Tyr Leu Ile Phe Asn Asp Val Ala Lys Phe Leu Lys Gln  
 145                  150                  155                  160  
 Gly Asp Ser Ala Asp Glu Thr Thr Ala His Lys Thr Glu Glu Glu Asn  
                   165                  170                  175  
 Ser Asp Ser Asp Ser Asp  
                   180

&lt;210&gt; 95

&lt;211&gt; 184

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 95

Met Asp Gly Leu Arg Gln Arg Val Glu His Phe Leu Glu Gln Arg Asn  
           1                  5                  10                  15  
 Leu Val Thr Glu Val Leu Gly Ala Leu Glu Ala Lys Thr Gly Val Glu  
                   20                  25                  30  
 Lys Arg Tyr Leu Ala Ala Gly Ala Val Thr Leu Leu Ser Leu Tyr Leu  
                   35                  40                  45  
 Leu Phe Gly Tyr Gly Ala Ser Leu Leu Cys Asn Leu Ile Gly Phe Val  
                   50                  55                  60  
 Tyr Pro Ala Tyr Ala Ser Ile Lys Ala Ile Glu Ser Pro Ser Lys Asp  
                   65                  70                  75                  80  
 Asp Asp Thr Val Trp Leu Thr Tyr Trp Val Val Tyr Ala Leu Phe Gly  
                   85                  90                  95  
 Leu Ala Glu Phe Phe Ser Asp Leu Leu Leu Ser Trp Phe Pro Phe Tyr  
                   100                  105                  110  
 Tyr Val Gly Lys Cys Ala Phe Leu Leu Phe Cys Met Ala Pro Arg Pro  
                   115                  120                  125  
 Trp Asn Gly Ala Leu Met Leu Tyr Gln Arg Val Val Arg Pro Leu Phe

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130                      135                      140  
 Leu Arg His His Gly Ala Val Asp Arg Ile Met Asn Asp Leu Ser Gly  
 145                      150                      155                      160  
 Arg Ala Leu Asp Ala Ala Ala Gly Ile Thr Arg Asn Val Lys Pro Ser  
                     165                      170                      175  
 Gln Thr Pro Gln Pro Lys Asp Lys  
                     180

&lt;210&gt; 96

&lt;211&gt; 140

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 96

Met Ser Arg Phe Leu Asn Val Leu Arg Ser Trp Leu Val Met Val Ser  
       1                      5                      10                      15  
 Ile Ile Ala Met Gly Asn Thr Leu Gln Ser Phe Arg Asp His Thr Phe  
                     20                      25                      30  
 Leu Tyr Glu Lys Leu Tyr Thr Gly Lys Pro Asn Leu Val Asn Gly Leu  
                     35                      40                      45  
 Gln Ala Arg Thr Phe Gly Ile Trp Thr Leu Leu Ser Ser Val Ile Arg  
                     50                      55                      60  
 Cys Leu Cys Ala Ile Asp Ile His Asn Lys Thr Leu Tyr His Ile Thr  
                     65                      70                      75                      80  
 Leu Trp Thr Phe Leu Leu Ala Leu Gly His Phe Leu Ser Glu Leu Phe  
                     85                      90                      95  
 Val Tyr Gly Thr Ala Ala Pro Thr Ile Gly Val Leu Ala Pro Leu Met  
                     100                      105                      110  
 Val Ala Ser Phe Ser Ile Leu Gly Met Leu Val Gly Leu Arg Tyr Leu  
                     115                      120                      125  
 Glu Val Glu Pro Val Ser Arg Gln Lys Lys Arg Asn  
                     130                      135                      140

&lt;210&gt; 97

&lt;211&gt; 153

&lt;212&gt; PRT

162/233

&lt;213&gt; Homo sapiens

&lt;400&gt; 97

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Met Asn Val Gly Val Ala His Ser Glu Val Asn Pro Asn Thr Arg Val
  1              5              10              15
Met Asn Ser Arg Gly Met Trp Leu Thr Tyr Ala Leu Gly Val Gly Leu
      20              25              30
Leu His Ile Val Leu Leu Ser Ile Pro Phe Phe Ser Val Pro Val Ala
      35              40              45
Trp Thr Leu Thr Asn Ile Ile His Asn Leu Gly Met Tyr Val Phe Leu
      50              55              60
His Ala Val Lys Gly Thr Pro Phe Glu Thr Pro Asp Gln Gly Lys Ala
      65              70              75              80
Arg Leu Leu Thr His Trp Glu Gln Leu Asp Tyr Gly Val Gln Phe Thr
      85              90              95
Ser Ser Arg Lys Phe Phe Thr Ile Ser Pro Ile Ile Leu Tyr Phe Leu
      100              105              110
Ala Ser Phe Tyr Thr Lys Tyr Asp Pro Thr His Phe Ile Leu Asn Thr
      115              120              125
Ala Ser Leu Leu Ser Val Leu Ile Pro Lys Met Pro Gln Leu His Gly
      130              135              140
Val Arg Ile Phe Gly Ile Asn Lys Tyr
145              150

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&lt;210&gt; 98

&lt;211&gt; 173

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 98

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Met Ala Ala Phe Leu Ile Gln Thr Lys Asp Asn Pro Met Lys Ala Val
  1              5              10              15
Gly Val Leu Ala Gly Thr Met Ala Thr Val Val Ala Ile Thr Val Leu
      20              25              30
Ile Ser Thr Ala Thr Phe Trp Arg Asn Lys Lys Ser Asn Lys Val Leu
      35              40              45
Pro Met Arg Arg Val Leu Arg Lys Arg Pro Ser Pro Ala Pro Arg Thr

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50                      55                      60  
 Ile Arg Ile Glu Trp Leu Lys Ser Lys Ser Thr Lys Ala Ala Thr Lys  
 65                      70                      75                      80  
 Phe Met Leu Lys Glu Lys Pro Pro Asn Glu Asn Cys Asn Asn Asn Ser  
                     85                      90                      95  
 Pro Glu Ser Ser Leu Leu Pro Arg Ala Pro Ala Leu Pro Pro Pro Pro  
                     100                      105                      110  
 Ser Val Ala Pro Ser Thr Gly Ala Ala Gln Trp Thr Val Pro Thr Val  
                     115                      120                      125  
 Ser Gly Ser Leu Thr Pro Gln Pro Thr Gln Pro Pro Pro Lys Pro Lys  
                     130                      135                      140  
 Thr Met Gly Ser Pro Val Gln Ser Thr Leu Ile Ser Glu Leu Lys Gln  
 145                      150                      155                      160  
 Lys Phe Glu Lys Lys Ser Val His Asn Lys Ala Tyr Phe  
                     165                      170

&lt;210&gt; 99

&lt;211&gt; 75

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 99

Met Ile Gly Asp Ile Leu Leu Phe Gly Thr Leu Leu Met Asn Ala Gly  
                     1                      5                      10                      15  
 Ala Val Leu Asn Phe Lys Leu Lys Lys Lys Asp Thr Gln Gly Phe Gly  
                     20                      25                      30  
 Glu Glu Ser Arg Glu Pro Ser Thr Gly Asp Asn Ile Arg Glu Phe Leu  
                     35                      40                      45  
 Leu Ser Leu Arg Tyr Phe Arg Ile Phe Ile Ala Leu Trp Asn Ile Phe  
                     50                      55                      60  
 Met Met Phe Cys Met Ile Val Leu Phe Gly Ser  
                     65                      70                      75

&lt;210&gt; 100

&lt;211&gt; 159

&lt;212&gt; PRT



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&lt;213&gt; Homo sapiens

&lt;400&gt; 100

Met Glu Leu Pro Ala Val Asn Leu Lys Val Ile Leu Leu Gly His Trp  
 1 5 10 15  
 Leu Leu Thr Thr Trp Gly Cys Ile Val Phe Ser Gly Ser Tyr Ala Trp  
 20 25 30  
 Ala Asn Phe Thr Ile Leu Ala Leu Gly Val Trp Ala Val Ala Gln Arg  
 35 40 45  
 Asp Ser Ile Asp Ala Ile Ser Met Phe Leu Gly Gly Leu Leu Ala Thr  
 50 55 60  
 Ile Phe Leu Asp Ile Val His Ile Ser Ile Phe Tyr Pro Arg Val Ser  
 65 70 75 80  
 Leu Thr Asp Thr Gly Arg Phe Gly Val Gly Met Ala Ile Leu Ser Leu  
 85 90 95  
 Leu Leu Lys Pro Leu Ser Cys Cys Phe Val Tyr His Met Tyr Arg Glu  
 100 105 110  
 Arg Gly Gly Glu Leu Leu Val His Thr Gly Phe Leu Gly Ser Ser Gln  
 115 120 125  
 Asp Arg Ser Ala Tyr Gln Thr Ile Asp Ser Ala Glu Ala Pro Ala Asp  
 130 135 140  
 Pro Phe Ala Val Pro Glu Gly Arg Ser Gln Asp Ala Arg Gly Tyr  
 145 150 155

&lt;210&gt; 101

&lt;211&gt; 909

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 101

atggaggcag agcagcggcc ggccggcggg gccagcgaag gggcgacccc tggactggag 60  
 gcggtgcctc ccgttgctcc ccgcctgcg accgcggcct caggtccgat ccccaaactc 120  
 gggcctgagc ctaagaggag gcacctggg acgtgctcc agcctacggt caacaagttc 180  
 tcccttcggg tgttcggcag ccacaaagca gtggaaatcg agcaggagcg ggtgaagtca 240  
 gcgggggcct ggatcatcca cccctacagc gacttcgggt tttactggga cctgatcatg 300  
 ctgctgctga tggtagggaa cctcatcgtc ctgcctgtgg gcacacatt cttcaaggag 360  
 gagaactccc cgccttggat cgtcttcaac gtattgtctg atactttctt cctactggat 420

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ctggtgctca acttccgaac gggcatcgtg gtggaggagg gtgctgagat cctgctggca 480
ccgcggggcca tcgcacgcg ctacctgcgc acctggttcc tggttgacct catctcttct 540
atccctgtgg attacatctt cctagtgggtg gagctggagc cacggttggc cgtgaggtc 600
tacaaaacgg caccggccct acgcctcgtt cgcttcacca agatcctaag cctgctgagg 660
ctgctccgcc tctccgcct catccgtac atacaccagt gggaggagat ctttcacatg 720
acctatgacc tggccagtgc tgtggttcgc atottcaacc tcattgggat gatgctgctg 780
ctatgtcact gggatggctg tctgcagttc ctggtgcca tgcgcagga ctccctccc 840
gactgctggg tctccatcaa ccacatggtg gtgagaagtc cccacagtc tgcccttct 900
gggccttct 909

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&lt;210&gt; 102

&lt;211&gt; 849

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 102

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atggcgcacc cccaccagct ttctgatgac acaagtccag cccagagccg gggctatggg 60
gcccagcggg cacctggtgg cctgagttat cctgcagcct ctcccacgcc ccatgcagcc 120
ttcctggctg acccgggtgc caacatggcc atggcctatg ggagcagcct ggccgcgcag 180
ggcaaggagc tgggtggataa gaacatcgac cgcttcatcc ccatcaccaa gctcaagtat 240
tactttgctg tggacacccat gtatgtgggc agaaagctgg gcctgctgtt cttccctac 300
ctacaccagg actgggaagt gcagtaccaa caggacaccc cgggtggccc ccgctttgac 360
gtcaatgcc cggacctcta cattocagca atggctttca tcacctacgt tttggtggct 420
ggtottgcgc tggggaccca ggataggttc tcccagacc tcctggggct gcaagcgagc 480
tcagccctgg cctggtgac cctggaggtg ctggccatcc tgcacagcct ctatctggtc 540
actgtcaaca ccgacctcac caccatcgac ctggtggcct tcttgggcta caaatatgtc 600
gggatgattg gcggggctct catgggcctg ctcttcggga agattggcta ctacctggtg 660
ctgggctggt gctgcgtagc catctttgtg ttcattgatc ggacgctgcg gctgaagatc 720
ttggcagacg cagcagctga ggggtcccgt gtgcgtgggg cccggaacca gctgcgcag 780
tacctgacca tggcggtggc ggcggcgag cctatgctca tgtactggt caccctccac 840
ctggtgcgg 849

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&lt;210&gt; 103

&lt;211&gt; 1464

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

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&lt;400&gt; 103

atggctggaa aggggtcatc aggcaggcgg cccctgctgc tggggctgct ggtggccgta	60
gccactgtcc acctggtcat ctgtccctac accaaagtgg aggagagctt caacctgcag	120
gccacacatg acctgctcta ccactggcaa gacctggagc agtacgacca tcttgagttc	180
cccgagctcg tccccaggac gttcctcggg ccagtgggtga tcgcagtgtt ctccagcccc	240
gcggtttacg tgctttcgtc gttagaaatg tccaagtttt actctcagct aatagttaga	300
ggagtgettg gactcggcgt gatttttgga ctctggacgt tacaaaagga agtgagacgg	360
cacttcgggg ccattggtggc caccatgttc tgctgggtga cggccatgca gttccacctg	420
atgttctact gcacgcggac actgcccatt gtgctggccc tgcctgtagt cctgctggcc	480
ctcgcggcct ggtgcggca cgagtgggc cgttcctct ggctgtcagc ctccgccatc	540
atcgtgttca ggggtgagct gtgcctgttc ctgggcctcc tgctgctgct ggccctgggc	600
aaccgaaagg tttctgtagt cagagccctt cgccacgccg tcccggcagg gatcctctgt	660
ttaggactga cggttgctgt ggaactttat ttttggcggc agctcacttg gccggaagga	720
aagggtgttt ggtacaacac tgtcctgaac aaaagctcca actgggggac ctccccgctg	780
ctgtggtact tctactcagc cctgccccgc ggccctgggt gcagcctgct ctccatcccc	840
ctgggcttgg tagacagaag gacgcacgcg ccgacggtgc tggcactggg ctccatggca	900
ctctactccc tctgccaca caaggagcta cgttcctca tctatgctt ccccatgctc	960
aacatcacgg ctgccagagg ctgtcctac ctgctgaata actataaaaa gtcttggtg	1020
tacaaagcag ggtctctgct tgtgatcgga cacctcgtg tgaatgccgc ctactcagcc	1080
acggccctgt atgtgtccca tttcaactac ccagggtggc tcgcaatgca gaggtgcac	1140
cagctggtgc cccccagac agacgtcctt ctgcacattg acgtggcagc cggccagaca	1200
ggtgtgtctc ggtttctcca agtcaacagc gcctggaggt acgacaagag ggaggatgtg	1260
cagccgggga caggcatgct ggcatacaca cacatcctca tggaggcggc ccctgggctc	1320
ctggccctct acagggacac acaccgggtc ctggccagcg tcgtggggac cacaggtgtg	1380
agtctgaacc tgacccaact gcccccttc aacgtccacc tgacagacaaa gctggtgctt	1440
ctggagaggc tccccgggc gtcc	1464

&lt;210&gt; 104

&lt;211&gt; 546

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 104

atgtggcccc cagaccccca ccccgaccgc gaccccgagc ctgccggcgg ctcccgctcc	60
ggccccgcgg tccccgggct ccgcgcctgt ctgccggcgc gggctttcct ctgctctctc	120
aaaggccgcc tctgctggc cgagtcgggt ctctcattca tcaattttat ctgctatgtg	180

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gcgtcctcag catctgcctt cctcacagcg cctctgctgg agttcctgct ggccttgtag 240
ttcctctttg ctgatgccat gcagctgaat gacaagtggc agggcttggtg ctggcccatg 300
atggacttcc tgcgctgtgt caccgcgggc ctcactact ttgctatctc catcacggcc 360
atcgccaagt actcggatgg ggcttccaaa gccgctgggg tgtttggctt ctttgctacc 420
atcgtgtttg caactgattt ctacctgac tttaacgacg tggccaaatt cctcaaaaca 480
ggggactctg cagatgagac cacagcccac aagacagaag aagagaattc cgactcggac 540
totgac 546

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&lt;210&gt; 105

&lt;211&gt; 552

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 105

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atggacggcc tgaggcagcg cgtggagcac ttcctggagc aaaggaacct ggtcaccgaa 60
gtgctggggg cgctggaggc caagaccggg gtggagaagc ggtatctggc tgcaggagcc 120
gtcactctgc taagcctgta totgctgttc ggctacggag cgtctctgct gtgcaatctc 180
atcggatttg tgtaccccg c atatgcctca atcaaagcta tcgagagccc aagcaaggac 240
gacgacaactg tgtggctcac ctactgggtg gtgtacgccc tgtttgggct ggccgagttc 300
ttcagcgatc tactcctgtc ctggttcctt ttctactacg tgggcaagtg cgccttcctg 360
ttgtttctgca tggctcccag gccctggaac ggggctctca tgotgtatca gcgcgtcgtg 420
cgtccgctgt tcctaaggca ccacggggcc gtagacagaa tcatgaacga cctcagcggg 480
cgagccctgg acgcgggcggc cggaataacc aggaacgtca agccaagcca gaccccgag 540
ccgaaggaca ag 552

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&lt;210&gt; 106

&lt;211&gt; 420

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 106

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atgagccgtt tcctgaatgt gttaagaagt tggtggtta tgggtgccat catagccatg 60
gggaacacgc tgcagagctt ccgagaccac acttttctct atgaaaagct ctacactggc 120
aagccaaacc ttgtgaatgg cctccaagct cggacctttg ggatctggac gctgctctca 180
tcagtgatc gctgcctctg tgccattgac attcacaaca agacgetota tcacatcaca 240
ctctggacct tcctccttgc cctggggcat ttcctctctg agttgtttgt ctatggaact 300
gcagctccca cgattggcgt cctggcacc ctagtggtgg caagtttctc catcctgggt 360

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atgctggctcg ggctccggta tctagaagta gaaccagtat ccagacagaa gaagagaaac 420

<210> 107

<211> 459

<212> DNA

<213> Homo sapiens

<400> 107

atgaacgttg gagttgccca cagtgaagtg aatccaaata cccgtgtcat gaacagccgg 60  
 ggtatgtggc tgacatatgc attgggagtt ggcttgettc atattgtctt actcagcatt 120  
 cccttcttca gtgttcctgt tgcttggact ttaacaaata ttatacataa tctggggatg 180  
 tacgtatttt tgcattgcagt gaaaggaaca cctttcgaaa ctctgacca gggtaaagca 240  
 aggtccctaa ctcatggga acaactggac tatggagtac agtttacatc ttcacggaag 300  
 tttttcaciaa tttctccaat aattctatat tttctggcaa gtttctatac gaagtatgat 360  
 ccaactcact tcatactaaa cacagcttct ctctgagtg tactaattcc caaatgccca 420  
 caactacatg gtgttcggat ctttgaatt aataagtat 459

<210> 108

<211> 519

<212> DNA

<213> Homo sapiens

<400> 108

atggctgcct tcctgataca gaccaaggac aaccccatga aggccgtggg tgtgctggcc 60  
 ggcaccatgg ccaccgtcgt ggcatacact gtctcatct ccaccgccac cttctggcgc 120  
 aacaagaagt ctaacaaggt cctgccaatg cggcgggtgc tccgcaagcg gccagccct 180  
 gcgccccgca ccatccgcat tgagtggctc aagtccaaga gcaccaagc cgctaccaag 240  
 ttcatgctca aagagaaacc tccaatgag aactgtaaca acaacagccc agaaagctct 300  
 ctgctcccga gagctccggc tctccctcca ccaccagcg tggcgcccag cactggcgca 360  
 gccagtgga ccgtgcctac tgtctotggc tctctactc cgcagccgac ccaacccccg 420  
 ccaaaaccca aaactatggg aagccccgtc cagtcaactc tgatctctga gctcaagcaa 480  
 aagtttgaga agaagagtgt gcacaacaag gcttacttc 519

<210> 109

<211> 225

<212> DNA

<213> Homo sapiens

169/233

&lt;400&gt; 109

atgatcggag acatcctgct gtccgggacg ttgctgatga atgccggggc ggtgctgaac	60
tttaagctga aaaagaagga cacgcagggc tttggggagg agtccaggga gccagcaca	120
ggtgacaaca tccgggaatt cttgctgagc ctcagatact ttcgaatctt catcgccctg	180
tggaacatct tcatgatgtt ctgcattgatt gtgctgttcg gctct	225

&lt;210&gt; 110

&lt;211&gt; 477

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 110

atggagotgc ctgctgtgaa cctgaagggtg attctcctag gtcactggct gctgacaacc	60
tggggctgca ttgtattctc aggetcctat gcctgggcca acttoaccat cctggccttg	120
ggcgtgtggg ctgtggctca gggggactcc atcgacgcca taagcatgtt tctgggtggc	180
ttgctggcca ccattctcct ggacatcgtg cacatcagca tcttctaccc gcgggtcagc	240
ctcagggaca cgggcgcgtt tggcgtgggc atggccatcc tcagcttget gctcaagccg	300
ctctcctget gcttcgtcta ccacatgtac cgggagcgcg ggggtgagct cctgggtcac	360
actggtttcc ttgggtcttc tcaggaccgt agtgccatcc agacgattga ctcagcagag	420
gcgcccgcag atccctttgc agtcccagag ggcaggagtc aagatgcccg aggggtac	477

&lt;210&gt; 111

&lt;211&gt; 3438

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (121)...(1032)

&lt;400&gt; 111

gcctacgacg cctccgctag agcccgcggg gctgcgccga ctctgctct ggaggggttg	60
cgggtacctg atggccacag agggctctag gaggccgagc gtgtaagcgg ggtgggcgcc	120
atg gag gca gag cag cgg ccg gcg gcg ggg gcc agc gaa ggg gcg acc	168
Met Glu Ala Glu Gln Arg Pro Ala Ala Gly Ala Ser Glu Gly Ala Thr	
1 5 10 15	
cct gga ctg gag gcg gtg cct ccc gtt gct ccc ccg cct gcg acc gcg	216
Pro Gly Leu Glu Ala Val Pro Pro Val Ala Pro Pro Pro Ala Thr Ala	

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20	25	30	
gcc tca ggt ccg atc ccc aaa tct ggg cct gag cct aag agg agg cac			264
Ala Ser Gly Pro Ile Pro Lys Ser Gly Pro Glu Pro Lys Arg Arg His			
35	40	45	
ctt ggg acg ctg ctc cag cct acg gtc aac aag ttc tcc ctt cgg gtg			312
Leu Gly Thr Leu Leu Gln Pro Thr Val Asn Lys Phe Ser Leu Arg Val			
50	55	60	
ttc ggc agc cac aaa gca gtg gaa atc gag cag gag cgg gtg aag tca			360
Phe Gly Ser His Lys Ala Val Glu Ile Glu Gln Glu Arg Val Lys Ser			
65	70	75	80
gcg ggg gcc tgg atc atc cac ccc tac agc gac ttc cgg ttt tac tgg			408
Ala Gly Ala Trp Ile Ile His Pro Tyr Ser Asp Phe Arg Phe Tyr Trp			
85	90	95	
gac ctg atc atg ctg ctg ctg atg gtg ggg aac ctc atc gtc ctg cct			456
Asp Leu Ile Met Leu Leu Leu Met Val Gly Asn Leu Ile Val Leu Pro			
100	105	110	
gtg ggc atc acc ttc ttc aag gag gag aac tcc ccg cct tgg atc gtc			504
Val Gly Ile Thr Phe Phe Lys Glu Glu Asn Ser Pro Pro Trp Ile Val			
115	120	125	
ttc aac gta ttg tct gat act ttc ttc cta ctg gat ctg gtg ctc aac			552
Phe Asn Val Leu Ser Asp Thr Phe Phe Leu Leu Asp Leu Val Leu Asn			
130	135	140	
ttc cga acg ggc atc gtg gtg gag gag ggt gct gag atc ctg ctg gca			600
Phe Arg Thr Gly Ile Val Val Glu Glu Gly Ala Glu Ile Leu Leu Ala			
145	150	155	160
ccg cgg gcc atc cgc acg cgc tac ctg cgc acc tgg ttc ctg gtt gac			648
Pro Arg Ala Ile Arg Thr Arg Tyr Leu Arg Thr Trp Phe Leu Val Asp			
165	170	175	
ctc atc tct tct atc cct gtg gat tac atc ttc cta gtg gtg gag ctg			696
Leu Ile Ser Ser Ile Pro Val Asp Tyr Ile Phe Leu Val Val Glu Leu			
180	185	190	
gag cca cgg ttg gac gct gag gtc tac aaa acg gca cgg gcc cta cgc			744
Glu Pro Arg Leu Asp Ala Glu Val Tyr Lys Thr Ala Arg Ala Leu Arg			
195	200	205	
atc gtt cgc ttc acc aag atc cta agc ctg ctg agg ctg ctc cgc ctc			792

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Ile Val Arg Phe Thr Lys Ile Leu Ser Leu Leu Arg Leu Leu Arg Leu	
210	215
220	
tcc cgc ctc atc cgc tac ata cac cag tgg gag gag atc ttt cac atg	840
Ser Arg Leu Ile Arg Tyr Ile His Gln Trp Glu Glu Ile Phe His Met	
225	230
235	240
acc tat gac ctg gcc agt gct gtg gtt cgc atc ttc aac ctc att ggg	888
Thr Tyr Asp Leu Ala Ser Ala Val Val Arg Ile Phe Asn Leu Ile Gly	
245	250
255	
atg atg ctg ctg cta tgt cac tgg gat ggc tgt ctg cag ttc ctg gtg	936
Met Met Leu Leu Leu Cys His Trp Asp Gly Cys Leu Gln Phe Leu Val	
260	265
270	
ccc atg ctg cag gac ttc cct ccc gac tgc tgg gtc tcc atc aac cac	984
Pro Met Leu Gln Asp Phe Pro Pro Asp Cys Trp Val Ser Ile Asn His	
275	280
285	
atg gtg gtg aga agt ccc cac agc tct gcc ttt cct ggg cct tct t	1030
Met Val Val Arg Ser Pro His Ser Ser Ala Phe Pro Gly Pro Ser	
290	295
300	
agggctcttc tgccctgagta gcagggatgg ccacaggag caggaggtgg gagatgatca	1090
caacagaaaa taggagcgag gaggtgggga ggaggaggga aagggaagg agaccagaa	1150
gaagtgcctg tgtgttgag ggagcaggca aaggaagggt acctaccgg aagctgaggc	1210
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caccgctacc agggcaagat gttcgatgag gaaagcatcc tgggcgagct gagcgagccg	1750
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gcccagccg accccagctt cgtcactgca gttctcacca agctgcgctt tgaggctctc	1870
cagccggggg atctcgtggt gcgtgagggc tccgtgggga ggaagatgta cttcatccag	1930
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tactttgggg agatctgcct gctaactagg ggccggcgca cagccagtgt tcgggctgac	2050
acctactgcc gcctttactc actcagcgtg gaccatttca atgctgtgct tgaggagtgc	2110



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cccatgatgc gccgggcctt tgagactgtg gccatggatc ggctgctccg catcgccaag 2170  
 aagaattcca tactgcagcg gaagcgetcc gagccaagtc caggcagcag tgggtggcatc 2230  
 atggagcagc acttggtgca acatgacaga gacatggctc ggggtgttcg gggtcggggc 2290  
 ccgagcacag gagctcagct tagtggaag ccagtactgt gggagccact ggtacatgcg 2350  
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 aggtaggggc aggaggagcc acatgagaga gggagaagga ccgcgtttac ctttagagtt 3250  
 ttgttttgtt ttttcttct gagtttctg ttggtgcagg aataagggaa aggcccaagg 3310  
 tatccaagcc tggggaaggg caggccagcc agcacctctg ccttctcagg gacaagagta 3370  
 gtcctttacc acctcactc tgctgtccc ctctcctact ctacagcatt aaagactgtg 3420  
 ggaccagg 3438

&lt;210&gt; 112

&lt;211&gt; 1144

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (56)...(907)

&lt;400&gt; 112

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 atg gcc gac ccc cac cag ctt ttc gat gac aca agt tca gcc cag agc 103  
 Met Ala Asp Pro His Gln Leu Phe Asp Asp Thr Ser Ser Ala Gln Ser

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1	5	10	15	
cgg ggc tat ggg gcc cag cgg gca cct ggt ggc ctg agt tat cct gca	151			
Arg Gly Tyr Gly Ala Gln Arg Ala Pro Gly Gly Leu Ser Tyr Pro Ala				
20	25	30		
gcc tct ccc acg ccc cat gca gcc ttc ctg gct gac ccg gtg tcc aac	199			
Ala Ser Pro Thr Pro His Ala Ala Phe Leu Ala Asp Pro Val Ser Asn				
35	40	45		
atg gcc atg gcc tat ggg agc agc ctg gcc gcg cag ggc aag gag ctg	247			
Met Ala Met Ala Tyr Gly Ser Ser Leu Ala Ala Gln Gly Lys Glu Leu				
50	55	60		
gtg gat aag aac atc gac cgc ttc atc ccc atc acc aag ctc aag tat	295			
Val Asp Lys Asn Ile Asp Arg Phe Ile Pro Ile Thr Lys Leu Lys Tyr				
65	70	75	80	
tac ttt gct gtg gac acc atg tat gtg ggc aga aag ctg ggc ctg ctg	343			
Tyr Phe Ala Val Asp Thr Met Tyr Val Gly Arg Lys Leu Gly Leu Leu				
85	90	95		
ttc ttc ccc tac cta cac cag gac tgg gaa gtg cag tac caa cag gac	391			
Phe Phe Pro Tyr Leu His Gln Asp Trp Glu Val Gln Tyr Gln Gln Asp				
100	105	110		
acc ccg gtg gcc ccc cgc ttt gac gtc aat gcc ccg gac ctc tac att	439			
Thr Pro Val Ala Pro Arg Phe Asp Val Asn Ala Pro Asp Leu Tyr Ile				
115	120	125		
cca gca atg gct ttc atc acc tac gtt ttg gtg gct ggt ctt gcg ctg	487			
Pro Ala Met Ala Phe Ile Thr Tyr Val Leu Val Ala Gly Leu Ala Leu				
130	135	140		
ggg acc cag gat agg ttc tcc cca gac ctc ctg ggg ctg caa gcg agc	535			
Gly Thr Gln Asp Arg Phe Ser Pro Asp Leu Leu Gly Leu Gln Ala Ser				
145	150	155	160	
tca gcc ctg gcc tgg ctg acc ctg gag gtg ctg gcc atc ctg ctc agc	583			
Ser Ala Leu Ala Trp Leu Thr Leu Glu Val Leu Ala Ile Leu Leu Ser				
165	170	175		
ctc tat ctg gtc act gtc aac acc gac ctc acc acc atc gac ctg gtg	631			
Leu Tyr Leu Val Thr Val Asn Thr Asp Leu Thr Thr Ile Asp Leu Val				
180	185	190		
gcc ttc ttg ggc tac aaa tat gtc ggg atg att ggc ggg gtc ctc atg	679			

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Ala Phe Leu Gly Tyr Lys Tyr Val Gly Met Ile Gly Gly Val Leu Met	
195 200 205	
ggc ctg ctc ttc ggg aag att ggc tac tac ctg gtg ctg ggc tgg tgc	727
Gly Leu Leu Phe Gly Lys Ile Gly Tyr Tyr Leu Val Leu Gly Trp Cys	
210 215 220	
tgc gta gcc atc ttt gtg ttc atg atc cgg acg ctg cgg ctg aag atc	775
Cys Val Ala Ile Phe Val Phe Met Ile Arg Thr Leu Arg Leu Lys Ile	
225 230 235 240	
ttg gca gac gca gca gct gag ggg gtc cgg gtg cgt ggg gcc cgg aac	823
Leu Ala Asp Ala Ala Ala Glu Gly Val Pro Val Arg Gly Ala Arg Asn	
245 250 255	
cag ctg cgc atg tac ctg acc atg gcg gtg gcg gcg gcg cag cct atg	871
Gln Leu Arg Met Tyr Leu Thr Met Ala Val Ala Ala Ala Gln Pro Met	
260 265 270	
ctc atg tac tgg ctc acc ttc cac ctg gtg cgg tgagcgcgcc cgctga	920
Leu Met Tyr Trp Leu Thr Phe His Leu Val Arg	
275 280	
acctcccgt gctgctgctg ctgctggggg ccaactgtggc cgccgaactc atctcctgcc	980
tgcaggcccc aaggccacc ctgtctggcc acaggcaccc cctccatccc atgtcccgcc	1040
cagccccgcc cccaacccaa ggtgctgaga gatctccagc tgacacaggcc accgccccag	1100
ggcgtggcgg ctgttacaga aacaataaac cctgatgggc atgg	1144
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<211> 2339	
<212> DNA	
<213> Homo sapiens	
<220>	
<221> CDS	
<222> (253)...(1719)	
<400> 113	
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tagatttggg caaggacttt agattcgggc tctgttctgt ttccgcgcgc ctgcttctctg	120
ccgaggctgg cccaggcagc cgcgcttcga aggacgcgcg cgggagctgc ggagcatgcg	180
tggagtggca gtgctaacgg ctggtgtctc gcaactgttg cctgtgaagg tacgtgaagc	240
tgaaagcctg ga atg gct gga aag ggg tca tca ggc agg cgg ccc ctg	288

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Met Ala Gly Lys Gly Ser Ser Gly Arg Arg Pro Leu																		
1						5						10						
ctg	ctg	ggg	ctg	ctg	gtg	gcc	gta	gcc	act	gtc	cac	ctg	gtc	atc	tgt		336	
Leu	Leu	Gly	Leu	Leu	Val	Ala	Val	Ala	Thr	Val	His	Leu	Val	Ile	Cys			
15						20						25						
ccc	tac	acc	aaa	gtg	gag	gag	agc	ttc	aac	ctg	cag	gcc	aca	cat	gac		384	
Pro	Tyr	Thr	Lys	Val	Glu	Glu	Ser	Phe	Asn	Leu	Gln	Ala	Thr	His	Asp			
30						35						40						
ctg	ctc	tac	cac	tgg	caa	gac	ctg	gag	cag	tac	gac	cat	ctt	gag	ttc		432	
Leu	Leu	Tyr	His	Trp	Gln	Asp	Leu	Glu	Gln	Tyr	Asp	His	Leu	Glu	Phe			
45						50						55						60
ccc	gga	gtc	gtc	ccc	agg	acg	ttc	ctc	ggg	cca	gtg	gtg	atc	gca	gtg		480	
Pro	Gly	Val	Val	Pro	Arg	Thr	Phe	Leu	Gly	Pro	Val	Val	Ile	Ala	Val			
65						70						75						
ttc	tcc	agc	ccc	gcg	gtt	tac	gtg	ctt	tgc	ctg	tta	gaa	atg	tcc	aag		528	
Phe	Ser	Ser	Pro	Ala	Val	Tyr	Val	Leu	Ser	Leu	Leu	Glu	Met	Ser	Lys			
80						85						90						
ttt	tac	tct	cag	cta	ata	gtt	aga	gga	gtg	ctt	gga	ctc	ggc	gtg	att		576	
Phe	Tyr	Ser	Gln	Leu	Ile	Val	Arg	Gly	Val	Leu	Gly	Leu	Gly	Val	Ile			
95						100						105						
ttt	gga	ctc	tgg	acg	tta	caa	aag	gaa	gtg	aga	cgg	cac	ttc	ggg	gcc		624	
Phe	Gly	Leu	Trp	Thr	Leu	Gln	Lys	Glu	Val	Arg	Arg	His	Phe	Gly	Ala			
110						115						120						
atg	gtg	gcc	acc	atg	ttc	tgc	tgg	gtg	acg	gcc	atg	cag	ttc	cac	ctg		672	
Met	Val	Ala	Thr	Met	Phe	Cys	Trp	Val	Thr	Ala	Met	Gln	Phe	His	Leu			
125						130						135						140
atg	ttc	tac	tgc	acg	cgg	aca	ctg	ccc	aat	gtg	ctg	gcc	ctg	cct	gta		720	
Met	Phe	Tyr	Cys	Thr	Arg	Thr	Leu	Pro	Asn	Val	Leu	Ala	Leu	Pro	Val			
145						150						155						
gtc	ctg	ctg	gcc	ctc	gcg	gcc	tgg	ctg	cgg	cac	gag	tgg	gcc	cgc	ttc		768	
Val	Leu	Leu	Ala	Leu	Ala	Ala	Trp	Leu	Arg	His	Glu	Trp	Ala	Arg	Phe			
160						165						170						
atc	tgg	ctg	tca	gcc	ttc	gcc	atc	atc	gtg	ttc	agg	gtg	gag	ctg	tgc		816	
Ile	Trp	Leu	Ser	Ala	Phe	Ala	Ile	Ile	Val	Phe	Arg	Val	Glu	Leu	Cys			
175						180						185						

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ctg ttc ctg ggc ctc ctg ctg ctg ctg gcc ttg ggc aac cga aag gtt	864
Leu Phe Leu Gly Leu Leu Leu Leu Leu Ala Leu Gly Asn Arg Lys Val	
190 195 200	
tct gta gtc aga gcc ctt cgc cac gcc gtc ccg gca ggg atc ctc tgt	912
Ser Val Val Arg Ala Leu Arg His Ala Val Pro Ala Gly Ile Leu Cys	
205 210 215 220	
tta gga ctg acg gtt gct gtg gac tct tat ttt tgg cgg cag ctc act	960
Leu Gly Leu Thr Val Ala Val Asp Ser Tyr Phe Trp Arg Gln Leu Thr	
225 230 235	
tgg ccg gaa gga aag gtg ctt tgg tac aac act gtc ctg aac aaa agc	1008
Trp Pro Glu Gly Lys Val Leu Trp Tyr Asn Thr Val Leu Asn Lys Ser	
240 245 250	
tcc aac tgg ggg acc tcc ccg ctg ctg tgg tac ttc tac tca gcc ctg	1056
Ser Asn Trp Gly Thr Ser Pro Leu Leu Trp Tyr Phe Tyr Ser Ala Leu	
255 260 265	
ccc cgc ggc ctg ggc tgc agc ctg ctc ttc atc ccc ctg ggc ttg gta	1104
Pro Arg Gly Leu Gly Cys Ser Leu Leu Phe Ile Pro Leu Gly Leu Val	
270 275 280	
gac aga agg acg cac gcg ccg acg gtg ctg gca ctg ggc ttc atg gca	1152
Asp Arg Arg Thr His Ala Pro Thr Val Leu Ala Leu Gly Phe Met Ala	
285 290 295 300	
ctc tac tcc ctc ctg cca cac aag gag cta cgc ttc atc atc tat gcc	1200
Leu Tyr Ser Leu Leu Pro His Lys Glu Leu Arg Phe Ile Ile Tyr Ala	
305 310 315	
ttc ccc atg ctc aac atc acg gct gcc aga ggc tgc tcc tac ctg ctg	1248
Phe Pro Met Leu Asn Ile Thr Ala Ala Arg Gly Cys Ser Tyr Leu Leu	
320 325 330	
aat aac tat aaa aag tct tgg ctg tac aaa gca ggg tct ctg ctt gtg	1296
Asn Asn Tyr Lys Lys Ser Trp Leu Tyr Lys Ala Gly Ser Leu Leu Val	
335 340 345	
atc gga cac ctc gtg gtg aat gcc gcc tac tca gcc acg gcc ctg tat	1344
Ile Gly His Leu Val Val Asn Ala Ala Tyr Ser Ala Thr Ala Leu Tyr	
350 355 360	
gtg tcc cat ttc aac tac cca ggt ggc gtc gca atg cag agg ctg cac	1392
Val Ser His Phe Asn Tyr Pro Gly Gly Val Ala Met Gln Arg Leu His	

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365	370	375	380	
cag ctg gtg ccc ccc cag aca gac gtc ctt ctg cac att gac gtg gca				1440
Gln Leu Val Pro Pro Gln Thr Asp Val Leu Leu His Ile Asp Val Ala				
385	390	395		
gcc gcc cag aca ggt gtg tct cgg ttt ctc caa gtc aac agc gcc tgg				1488
Ala Ala Gln Thr Gly Val Ser Arg Phe Leu Gln Val Asn Ser Ala Trp				
400	405	410		
agg tac gac aag agg gag gat gtg cag ccg ggg aca ggc atg ctg gca				1536
Arg Tyr Asp Lys Arg Glu Asp Val Gln Pro Gly Thr Gly Met Leu Ala				
415	420	425		
tac aca cac atc ctc atg gag gcg gcc cct ggg ctc ctg gcc ctc tac				1584
Tyr Thr His Ile Leu Met Glu Ala Ala Pro Gly Leu Leu Ala Leu Tyr				
430	435	440		
agg gac aca cac cgg gtc ctg gcc agc gtc gtg ggg acc aca ggt gtg				1632
Arg Asp Thr His Arg Val Leu Ala Ser Val Val Gly Thr Thr Gly Val				
445	450	455	460	
agt ctg aac ctg acc caa ctg ccc ccc ttc aac gtc cac ctg cag aca				1680
Ser Leu Asn Leu Thr Gln Leu Pro Pro Phe Asn Val His Leu Gln Thr				
465	470	475		
aag ctg gtg ctt ctg gag agg ctc ccc cgg ccg tcc tgagggggac cagg				1730
Lys Leu Val Leu Leu Glu Arg Leu Pro Arg Pro Ser				
480	485			
cagccctcag cagccacagg ccttcaggga gctgttatca ctaccagttt ctggcacaat				1790
tccagcacaa ttatgacaat tcagagaagc aagtcaaagg actgggcacc tgcctctgac				1850
agacaccaga ccagggtccag ggcctcctcc acagcctcag ctggggctct cagcaccaaa				1910
gaacgagggg cccaggtctt gttggcaccc cgggagccac tgcccagggt gatggtggcc				1970
agctcagggc ttcctgcggg tgactgtcgc ccagaccagg tgccattcat gactaatcag				2030
gagcagcggg ctcaccacagg cacctgtctg ccaggaggcc acgtgtgtcc tgcccaccca				2090
gggggagctg tatttttgga gcaccccaag cttgtgtccc gagggcctct tggggcacct				2150
aagacagcac cccctctcag gggagaccat ggtggccccg gccgcacccc cccaccctgg				2210
tgccaccact gcaacttttg tattcacagg catcccatct ccatcacaga taaaatctta				2270
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gaacctctc				2339

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&lt;211&gt; 1756

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (102)...(650)

&lt;400&gt; 114

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                                     Met Trp Pro Pro
                                     1
gac ccc gac ccc gac ccg gac ccc gag cct gcc ggc ggc tcc cgt ccc      161
Asp Pro Asp Pro Asp Pro Asp Pro Glu Pro Ala Gly Gly Ser Arg Pro
   5               10               15               20
ggc ccc gcg gtc ccc ggg ctc cgc gcc ctg ctg ccg gcg cgg gct ttc      209
Gly Pro Ala Val Pro Gly Leu Arg Ala Leu Leu Pro Ala Arg Ala Phe
               25               30               35
ctc tgc tct ctc aaa ggc cgc ctc ctg ctg gcc gag tcg ggt ctc tca      257
Leu Cys Ser Leu Lys Gly Arg Leu Leu Leu Ala Glu Ser Gly Leu Ser
               40               45               50
ttc atc act ttt atc tgc tat gtg gcg tcc tca gca tct gcc ttc ctc      305
Phe Ile Thr Phe Ile Cys Tyr Val Ala Ser Ser Ala Ser Ala Phe Leu
               55               60               65
aca gcg cct ctg ctg gag ttc ctg ctg gcc ttg tac ttc ctc ttt gct      353
Thr Ala Pro Leu Leu Glu Phe Leu Leu Ala Leu Tyr Phe Leu Phe Ala
               70               75               80
gat gcc atg cag ctg aat gac aag tgg cag ggc ttg tgc tgg ccc atg      401
Asp Ala Met Gln Leu Asn Asp Lys Trp Gln Gly Leu Cys Trp Pro Met
               85               90               95               100
atg gac ttc ctg cgc tgt gtc acc gcg gcc ctc atc tac ttt gct atc      449
Met Asp Phe Leu Arg Cys Val Thr Ala Ala Leu Ile Tyr Phe Ala Ile
               105               110               115
tcc atc acg gcc atc gcc aag tac tcg gat ggg gct tcc aaa gcc gct      497
Ser Ile Thr Ala Ile Ala Lys Tyr Ser Asp Gly Ala Ser Lys Ala Ala
               120               125               130

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ggg gtg ttt ggc ttc ttt gct acc atc gtg ttt gca act gat ttc tac 545  
 Gly Val Phe Gly Phe Phe Ala Thr Ile Val Phe Ala Thr Asp Phe Tyr  
 135 140 145  
 ctg atc ttt aac gac gtg gcc aaa ttc ctc aaa caa ggg gac tct gca 593  
 Leu Ile Phe Asn Asp Val Ala Lys Phe Leu Lys Gln Gly Asp Ser Ala  
 150 155 160  
 gat gag acc aca gcc cac aag aca gaa gaa gag aat tcc gac tcg gac 641  
 Asp Glu Thr Thr Ala His Lys Thr Glu Glu Glu Asn Ser Asp Ser Asp  
 165 170 175 180  
 tct gac tgaaggcctg gcgggtgcct tggcaacctg agccacacag gcc 690  
 Ser Asp

tccacccctg cgctcacag gggctcgtgg cgttgagcg gaggcctgga cttctgagtt 750  
 gcagaggggg ctgaggacac agcaggcccc ctacagcctc aggttctgcc tgagcccagc 810  
 ctaccaggct tgccctcag ctccagcactg ttgaccacgc tgcgtatgag ggcattcttg 870  
 gtatcccact ccttctcccc atttctgtcc cacaggcctt cagcccttta acgtctctgc 930  
 caaaaaccag cacaaggaga caaagcagag ccttgtctgt atctgggcag caggtgttcc 990  
 atgctgctag gtggcggggg tcgggggtct tctgtttcac taacaggaac aaagacagaa 1050  
 accatgacag ggctgccccg ccaggccccg gtgggtttgt ctgcacttg tgctcctgcc 1110  
 cacaccagcc acttttgtga caatgacct tccaagaatc tttggttcaa ggagcaccag 1170  
 ttccctcttc attcttgag caggagagaa ttgacctttg ccttgtcgc caggaagtgg 1230  
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 tgaccattct ggggtctaaga ctgtttcaaa gaagagctca tagactgact ggtccagaag 1350  
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 caaacctcc ttcttcctag agcccagcca gcaggcagga gttcctggac cctcaggaca 1470  
 gtgaacttcc agacctcagg gcaggcttat gggccactgc aggagatgag accagccttc 1530  
 tgtgttcacc taacgattta tactgtgtat ctgtctttga tggaattttg taacttttta 1590  
 tattttttta tgcaaaagca gctctttaac agatggcatt ttctgtgact ctaggcctca 1650  
 caaaagagcc agagttctgg acccatgttt ggagcatttg tagccttatt ctcttgctg 1710  
 tgaatctctt accctgaaaa aaagccataa tgaattaagc caaaag 1756

&lt;210&gt; 115

&lt;211&gt; 1418

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens



180/233

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (149)...(703)

&lt;400&gt; 115

attggtccta gcggggggcc gggggcggac accggcgcgg ggccggagca gcgcggctca	60
ggctgcggga aagcgggtgcg cgtgcagcgg ggtgggtgcc ctggtccgcg ggcgagctcg	120
agcagccaac cccgggcgcg tcggggcc atg gac ggc ctg agg cag cgc gtg	172
Met Asp Gly Leu Arg Gln Arg Val	
1 5	
gag cac ttc ctg gag caa agg aac ctg gtc acc gaa gtg ctg ggg gcg	220
Glu His Phe Leu Glu Gln Arg Asn Leu Val Thr Glu Val Leu Gly Ala	
10 15 20	
ctg gag gcc aag acc ggg gtg gag aag cgg tat ctg gct gca gga gcc	268
Leu Glu Ala Lys Thr Gly Val Glu Lys Arg Tyr Leu Ala Ala Gly Ala	
25 30 35 40	
gtc act ctg cta agc ctg tat ctg ctg ttc ggc tac gga gcg tct ctg	316
Val Thr Leu Leu Ser Leu Tyr Leu Leu Phe Gly Tyr Gly Ala Ser Leu	
45 50 55	
ctg tgc aat ctc atc gga ttt gtg tac ccc gca tat gcc tca atc aaa	364
Leu Cys Asn Leu Ile Gly Phe Val Tyr Pro Ala Tyr Ala Ser Ile Lys	
60 65 70	
gct atc gag agc cca agc aag gac gac gac act gtg tgg ctc acc tac	412
Ala Ile Glu Ser Pro Ser Lys Asp Asp Asp Thr Val Trp Leu Thr Tyr	
75 80 85	
tgg gtg gtg tac gcc ctg ttt ggg ctg gcc gag ttc ttc agc gat cta	460
Trp Val Val Tyr Ala Leu Phe Gly Leu Ala Glu Phe Phe Ser Asp Leu	
90 95 100	
ctc ctg tcc tgg ttc cct ttc tac tac gtg ggc aag tgc gcc ttc ctg	508
Leu Leu Ser Trp Phe Pro Phe Tyr Tyr Val Gly Lys Cys Ala Phe Leu	
105 110 115 120	
ttg ttc tgc atg gct ccc agg ccc tgg aac ggg gct ctc atg ctg tat	556
Leu Phe Cys Met Ala Pro Arg Pro Trp Asn Gly Ala Leu Met Leu Tyr	
125 130 135	
cag cgc gtc gtg cgt ccg ctg ttc cta agg cac cac ggg gcc gta gac	604
Gln Arg Val Val Arg Pro Leu Phe Leu Arg His His Gly Ala Val Asp	

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140	145	150	
aga atc atg aac gac ctc agc ggg cga gcc ctg gac gcg gcg gcc gga			652
Arg Ile Met Asn Asp Leu Ser Gly Arg Ala Leu Asp Ala Ala Gly			
155	160	165	
ata acc agg aac gtc aag cca agc cag acc ccg cag ccg aag gac aag			700
Ile Thr Arg Asn Val Lys Pro Ser Gln Thr Pro Gln Pro Lys Asp Lys			
170	175	180	
tgaagcagcc ccctgagcct cacaaggacc tcctggettg tgaggagggg gccgcgccag			760
gtcccaggc ctccacagag tcttcagcgc atcccccaac agcagcccct gccagtccct			820
cgggtccagg caaggccctg ggggtctcct taaatgccac ctcgggcaag tccagtcct			880
agtctctggc cacccccagc tctggatccc agggccagct gccctctggc tctggetgtg			940
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cctcggggcc cctgcagcca cccaactca cctccagccc ggtctcacc atggtccagt			1120
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acgcagcccc caagaccagc ggacagcgcc agaaggaatc gtcgaaacag cctgccagca			1240
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agtccaccac cgagatcacc tgcagctggc cacaccacag gccccctgc ctgcagcact			1360
actggtgcct gaaacacctg gcctgctagg aggtccaat aaagctaacc cggaccag			1418

&lt;210&gt; 116

&lt;211&gt; 1211

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (133)...(555)

&lt;400&gt; 116

gaaaatggct caggtggaact ccgggctgga gctgtcctgg gggagcttgt ttgcggcagc	60
ggctgctgct gccactgctg tgctgggggc ccggtcgcca ggcaaaaagc cctcccacgt	120
ttgaggggag tc atg agc cgt ttc ctg aat gtg tta aga agt tgg ctg	168

Met Ser Arg Phe Leu Asn Val Leu Arg Ser Trp Leu

1

5

10

gtt atg gtg tcc atc ata gcc atg ggg aac acg ctg cag agc ttc cga	216
Val Met Val Ser Ile Ile Ala Met Gly Asn Thr Leu Gln Ser Phe Arg	

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15	20	25	
gac cac act ttt ctc tat gaa aag ctc tac act ggc aag cca aac ctt			264
Asp His Thr Phe Leu Tyr Glu Lys Leu Tyr Thr Gly Lys Pro Asn Leu			
30	35	40	
gtg aat ggc ctc caa gct cgg acc ttt ggg atc tgg acg ctg ctc tca			312
Val Asn Gly Leu Gln Ala Arg Thr Phe Gly Ile Trp Thr Leu Leu Ser			
45	50	55	60
tca gtg att cgc tgc ctc tgt gcc att gac att cac aac aag acg ctc			360
Ser Val Ile Arg Cys Leu Cys Ala Ile Asp Ile His Asn Lys Thr Leu			
65	70	75	
tat cac atc aca ctc tgg acc ttc ctc ctt gcc ctg ggg cat ttc ctc			408
Tyr His Ile Thr Leu Trp Thr Phe Leu Leu Ala Leu Gly His Phe Leu			
80	85	90	
tct gag ttg ttt gtc tat gga act gca gct ccc acg att ggc gtc ctg			456
Ser Glu Leu Phe Val Tyr Gly Thr Ala Ala Pro Thr Ile Gly Val Leu			
95	100	105	
gca ccc ctg atg gtg gca agt ttc tcc atc ctg ggt atg ctg gtc ggg			504
Ala Pro Leu Met Val Ala Ser Phe Ser Ile Leu Gly Met Leu Val Gly			
110	115	120	
ctc cgg tat cta gaa gta gaa cca gta tcc aga cag aag aag aga aac			552
Leu Arg Tyr Leu Glu Val Glu Pro Val Ser Arg Gln Lys Lys Arg Asn			
125	130	135	140
tgaggcca gcattatcac ctccaggact ttctcgTTTT ccaccttggc catcttcttc			610
cttcgtcgtc tctcctcttt aatttctttt ctattccatc atctgccctt ttattcactt			670
ttagcctctt tttttaattt ttaaaattta aagatatgca tactgaaaag tatataacat			730
gtacgtacaa tttaaagaat aattttaaag tgaatactac gtaactccat ccaagtcaag			790
aaattgccag cttctcgga gcccactgtg tctccttccc ctacctgcaa cctcttcag			850
gtccctttt ccagccttcc cctttttccc ttttattttc atgccttgat ttgacttggtg			910
tggtgggaac atgtgaacta tgaaacttaa acctgctgcc caccagagc agctgtgacc			970
aagggtgcc tcaaggggtt gtccacgcag gttgggctcc tctctgctgc tggaccaag			1030
actctgaacc ttccaagga caggcagttc ttctaagaag ggctccctg tgtgtgagca			1090
agaccacagc tctccttcta tctacagatg catgaggggtt ggaagagtct gggctgtttt			1150
tagacctctt ggtcagctgt atttgtgtaa caacttttgt aataaataga aaaaccctct			1210
g			1211

183/233

&lt;210&gt; 117

&lt;211&gt; 1099

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (183)...(644)

&lt;400&gt; 117

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tttatggata cattaagtca aatataagag tctgactact tgacacactg gctcgagcaa      180
ac atg aac gtt gga gtt gcc cac agt gaa gtg aat cca aat acc cgt      227
      Met Asn Val Gly Val Ala His Ser Glu Val Asn Pro Asn Thr Arg
          1             5             10             15
gtc atg aac agc cgg ggt atg tgg ctg aca tat gca ttg gga gtt ggc      275
Val Met Asn Ser Arg Gly Met Trp Leu Thr Tyr Ala Leu Gly Val Gly
          20             25             30
ttg ctt cat att gtc tta ctc agc att ccc ttc ttc agt gtt cct gtt      323
Leu Leu His Ile Val Leu Leu Ser Ile Pro Phe Phe Ser Val Pro Val
          35             40             45
gct tgg act tta aca aat att ata cat aat ctg ggg atg tac gta ttt      371
Ala Trp Thr Leu Thr Asn Ile Ile His Asn Leu Gly Met Tyr Val Phe
          50             55             60
ttg cat gca gtg aaa gga aca cct ttc gaa act cct gac cag ggt aaa      419
Leu His Ala Val Lys Gly Thr Pro Phe Glu Thr Pro Asp Gln Gly Lys
          65             70             75
gca agg ctc cta act cat tgg gaa caa ctg gac tat gga gta cag ttt      467
Ala Arg Leu Leu Thr His Trp Glu Gln Leu Asp Tyr Gly Val Gln Phe
          80             85             90             95
aca tct tca cgg aag ttt ttc aca att tct cca ata att cta tat ttt      515
Thr Ser Ser Arg Lys Phe Phe Thr Ile Ser Pro Ile Ile Leu Tyr Phe
          100            105            110
ctg gca agt ttc tat acg aag tat gat cca act cac ttc atc cta aac      563
Leu Ala Ser Phe Tyr Thr Lys Tyr Asp Pro Thr His Phe Ile Leu Asn
          115            120            125

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aca gct tct ctc ctg agt gta cta att ccc aaa atg cca caa cta cat 611  
 Thr Ala Ser Leu Leu Ser Val Leu Ile Pro Lys Met Pro Gln Leu His  
 130 135 140  
 ggt gtt cgg atc ttt gga att aat aag tat tgaaatgttt tgaaactga 660  
 Gly Val Arg Ile Phe Gly Ile Asn Lys Tyr  
 145 150  
 aaaaaaattt tacagctact gaatttctta taaggaagga gtggttagta aactgcactg 720  
 tttctctgat aatgtgaaat gagaagtatt tacattggag ggccaatggc tggctcctca 780  
 agtgctgttt tgaagtgcag atttccatta aatgatgcct ctgtttaata cacctggtag 840  
 atttctgaag aggggcttta taagcaggct gggcaggccc agcttataag ttaaagggca 900  
 tcacagttag ggtgtagtag ataaattcaa ggaaataaga gatttgtaag aaactaggac 960  
 cagcttaact tataatgaat gggcattgtg ttaagaaaag aacatttcca gtcattcagc 1020  
 tgtggttatt taaagcagac ttacatgtaa accggaatcc tototataca agtttattaa 1080  
 agattatttt tattaccgt 1099

<210> 118  
 <211> 3489  
 <212> DNA  
 <213> Homo sapiens  
 <220>  
 <221> CDS  
 <222> (227)...(748)  
 <400> 118

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 aaaagcccat agtgccatc agattctcaa agggactcct gactccagaa agtttaaaaa 120  
 ccattaggct taaggaagca catacctact ctgtactcca gggaccaggt gggaacagct 180  
 gagtgcaggg agtggcttct tctttcagac cctctcccgg agcccc atg gct gcc 235  
 Met Ala Ala  
 1  
 ttc ctg ata cag acc aag gac aac ccc atg aag gcc gtg ggt gtg ctg 283  
 Phe Leu Ile Gln Thr Lys Asp Asn Pro Met Lys Ala Val Gly Val Leu  
 5 10 15  
 gcc gcc acc atg gcc acc gtc gtg gcc atc act gtc ctc atc tcc acc 331  
 Ala Gly Thr Met Ala Thr Val Val Ala Ile Thr Val Leu Ile Ser Thr  
 20 25 30 35

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gcc acc ttc tgg cgc aac aag aag tct aac aag gtc ctg cca atg cgg 379  
 Ala Thr Phe Trp Arg Asn Lys Lys Ser Asn Lys Val Leu Pro Met Arg  
 40 45 50  
 cgg gtg ctc cgc aag cgg ccc agc cct gcg ccc cgc acc atc cgc att 427  
 Arg Val Leu Arg Lys Arg Pro Ser Pro Ala Pro Arg Thr Ile Arg Ile  
 55 60 65  
 gag tgg ctc aag tcc aag agc acc aaa gcc gct acc aag ttc atg ctc 475  
 Glu Trp Leu Lys Ser Lys Ser Thr Lys Ala Ala Thr Lys Phe Met Leu  
 70 75 80  
 aaa gag aaa cct ccc aat gag aac tgt aac aac aac agc cca gaa agc 523  
 Lys Glu Lys Pro Pro Asn Glu Asn Cys Asn Asn Asn Ser Pro Glu Ser  
 85 90 95  
 tct ctg ctc ccg aga gct ccg gct ctc cct cca cca ccc agc gtg gcg 571  
 Ser Leu Leu Pro Arg Ala Pro Ala Leu Pro Pro Pro Pro Ser Val Ala  
 100 105 110 115  
 ccc agc act ggc gca gcc cag tgg acc gtg cct act gtc tct ggc tct 619  
 Pro Ser Thr Gly Ala Ala Gln Trp Thr Val Pro Thr Val Ser Gly Ser  
 120 125 130  
 ctc act ccg cag ccg acc caa ccc ccg cca aaa ccc aaa act atg gga 667  
 Leu Thr Pro Gln Pro Thr Gln Pro Pro Pro Lys Pro Lys Thr Met Gly  
 135 140 145  
 agc ccc gtc cag tca act ctg atc tct gag ctc aag caa aag ttt gag 715  
 Ser Pro Val Gln Ser Thr Leu Ile Ser Glu Leu Lys Gln Lys Phe Glu  
 150 155 160  
 aag aag agt gtg cac aac aag gct tac ttc tagtgtatgc cctat 760  
 Lys Lys Ser Val His Asn Lys Ala Tyr Phe  
 165 170  
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 caaatccttg gcactactac aatgccctcc attcttcagg gctgagaatt gacgagaagc 1060  
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 cgcctgcagc tgagagcagg agcaggaaaa ggaggctcag cactgtctca ggctggaggt 1240

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gaaaacacac	tgactgtggg	actgtgccag	gatgcatttg	gaaagataga	gcattctgtc	1360
tgggcagaga	ctgtggaccc	tggtatgccc	acgtgggaca	gaggacacag	aggtggaaga	1420
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gtcaaagctg	gagctataga	ggtagcccta	aaggcaacta	gaagagcate	agggctgtct	1540
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187/233

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 cctcatggac aataaatgga tgtgacacc 3489

&lt;210&gt; 119

&lt;211&gt; 931

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (25)...(252)

&lt;400&gt; 119

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Met Ile Gly Asp Ile Leu Leu Phe Gly

1

5

acg ttg ctg atg aat gcc ggg gcg gtg ctg aac ttt aag ctg aaa aag 99

Thr Leu Leu Met Asn Ala Gly Ala Val Leu Asn Phe Lys Leu Lys Lys

10

15

20

25

aag gac acg cag ggc ttt ggg gag gag tcc agg gag ccc agc aca ggt 147

Lys Asp Thr Gln Gly Phe Gly Glu Glu Ser Arg Glu Pro Ser Thr Gly

30

35

40

gac aac atc cgg gaa ttc ttg ctg agc ctc aga tac ttt cga atc ttc 195

Asp Asn Ile Arg Glu Phe Leu Leu Ser Leu Arg Tyr Phe Arg Ile Phe

45

50

55

atc gcc ctg tgg aac atc ttc atg atg ttc tgc atg att gtg ctg ttc 243

Ile Ala Leu Trp Asn Ile Phe Met Met Phe Cys Met Ile Val Leu Phe

60

65

70

ggc tct tgaatcccag cgatgaaacc aggaactcac tttcccggga tgccgagtct c 300

Gly Ser

75

cattcctcca ttctgatga cttcaagaat gtttttgacc agaaaaccga caacottccc 360

agaaagtcca agctcgtggt ggggtgaaaa gtgttcgcca aggtgtgcac ggtttcccag 420

ccacgtccct gttttcaaag atagtttcac tttggtctct gaattgaaat gctgtctact 480

gaaagggttt caggagcgtt tatgtaagg gctgtgatga aattgcattc cccatagata 540

aaagaaaaat cattctatc cagagatctg agcagaagga ttggttggtt agtttaacac 600



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 gctgcgatta accctaaagg ctttaaggaa cgggccacct gtaacagaga caccagcctt 780  
 cctgtataga cactaaattg ttagcaagag tgttgagcta gtccctggtg aagtgtttcc 840  
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 ctttggttaa taaaatgact ttgggagcca t 931

&lt;210&gt; 120

&lt;211&gt; 1123

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (68)...(547)

&lt;400&gt; 120

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 agtcggg atg gag ctg cct gct gtg aac ctg aag gtg att ctc cta ggt 109  
 Met Glu Leu Pro Ala Val Asn Leu Lys Val Ile Leu Leu Gly  
 1 5 10  
 cac tgg ctg ctg aca acc tgg ggc tgc att gta ttc tca ggc tcc tat 157  
 His Trp Leu Leu Thr Thr Trp Gly Cys Ile Val Phe Ser Gly Ser Tyr  
 15 20 25 30  
 gcc tgg gcc aac ttc acc atc ctg gcc ttg ggc gtg tgg gct gtg gct 205  
 Ala Trp Ala Asn Phe Thr Ile Leu Ala Leu Gly Val Trp Ala Val Ala  
 35 40 45  
 cag cgg gac tcc atc gac gcc ata agc atg ttt ctg ggt ggc ttg ctg 253  
 Gln Arg Asp Ser Ile Asp Ala Ile Ser Met Phe Leu Gly Gly Leu Leu  
 50 55 60  
 gcc acc atc ttc ctg gac atc gtg cac atc agc atc ttc tac ccg cgg 301  
 Ala Thr Ile Phe Leu Asp Ile Val His Ile Ser Ile Phe Tyr Pro Arg  
 65 70 75  
 gtc agc ctc acg gac acg ggc cgc ttt ggc gtg ggc atg gcc atc ctc 349  
 Val Ser Leu Thr Asp Thr Gly Arg Phe Gly Val Gly Met Ala Ile Leu  
 80 85 90  
 agc ttg ctg ctc aag ccg ctc tcc tgc tgc ttc gtc tac cac atg tac 397

189/233

Ser Leu Leu Leu Lys Pro Leu Ser Cys Cys Phe Val Tyr His Met Tyr  
 95 100 105 110  
 cgg gag cgc ggg ggt gag ctc ctg gtc cac act ggt ttc ctt ggg tct 445  
 Arg Glu Arg Gly Gly Glu Leu Leu Val His Thr Gly Phe Leu Gly Ser  
 115 120 125  
 tct cag gac cgt agt gcc tac cag acg att gac tca gca gag gcg ccc 493  
 Ser Gln Asp Arg Ser Ala Tyr Gln Thr Ile Asp Ser Ala Glu Ala Pro  
 130 135 140  
 gca gat ccc ttt gca gtc cca gag ggc agg agt caa gat gcc cga ggg 541  
 Ala Asp Pro Phe Ala Val Pro Glu Gly Arg Ser Gln Asp Ala Arg Gly  
 145 150 155  
 tac tgaagccagc cacgctgcgc ccggccctgc cccgggcctt cctcgtgcct gggagg 600  
 Tyr  
  
 tcgttctagg gatgctcctg acctccgtct cttggacctg agatggaatg tgtccccagc 660  
 tcagggattg cctgaaccaa gaggccagga gcccccatgg gccgcccagt accatgcaca 720  
 ctctgtccc gaactccctg aggcctcccc tcccttcagg gcacccactg gttcccaggc 780  
 tggaaccagg gtctctcttt acctcctacc ccatggtggc accacagagg ccctcagccg 840  
 agtcctgcct gagtgttgca agctcaggcc tttaaggact gctgatgcc cctcaggcct 900  
 cccccaagtt tgctgggctt tgggtgaagc cctgagagct tcaggtcctg ctcagcccca 960  
 ggagcagtct ggcatgggag tgaggccccc tctttctcac tgctggtca catggtgcct 1020  
 agggatgcag ggctggaggg cagaggtgtc agcaacactg tgaccacca caacctccag 1080  
 cctccctttt cagagcacag cattaaagtt tggggaattc tgt 1123

&lt;210&gt; 121

&lt;211&gt; 636

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 121

Met Thr Thr Trp Ser Leu Arg Arg Arg Pro Ala Arg Thr Leu Gly Leu  
 1 5 10 15  
 Leu Leu Leu Val Val Leu Gly Phe Leu Val Leu Arg Arg Leu Asp Trp  
 20 25 30  
 Ser Thr Leu Val Pro Leu Arg Leu Arg His Arg Gln Leu Gly Leu Gln  
 35 40 45

190/233

Ala Lys Gly Trp Asn Phe Met Leu Glu Asp Ser Thr Phe Trp Ile Phe  
 50 55 60  
 Gly Gly Ser Ile His Tyr Phe Arg Val Pro Arg Glu Tyr Trp Arg Asp  
 65 70 75 80  
 Arg Leu Leu Lys Met Lys Ala Cys Gly Leu Asn Thr Leu Thr Thr Tyr  
 85 90 95  
 Val Pro Trp Asn Leu His Glu Pro Glu Arg Gly Lys Phe Asp Phe Ser  
 100 105 110  
 Gly Asn Leu Asp Leu Glu Ala Phe Val Leu Met Ala Ala Glu Ile Gly  
 115 120 125  
 Leu Trp Val Ile Leu Arg Pro Gly Pro Tyr Ile Cys Ser Glu Met Asp  
 130 135 140  
 Leu Gly Gly Leu Pro Ser Trp Leu Leu Gln Asp Pro Gly Met Arg Leu  
 145 150 155 160  
 Arg Thr Thr Tyr Lys Gly Phe Thr Glu Ala Val Asp Leu Tyr Phe Asp  
 165 170 175  
 His Leu Met Ser Arg Val Val Pro Leu Gln Tyr Lys Arg Gly Gly Pro  
 180 185 190  
 Ile Ile Ala Val Gln Val Glu Asn Glu Tyr Gly Ser Tyr Asn Lys Asp  
 195 200 205  
 Pro Ala Tyr Met Pro Tyr Val Lys Lys Ala Leu Glu Asp Arg Gly Ile  
 210 215 220  
 Val Glu Leu Leu Leu Thr Ser Asp Asn Lys Asp Gly Leu Ser Lys Gly  
 225 230 235 240  
 Ile Val Gln Gly Val Leu Ala Thr Ile Asn Leu Gln Ser Thr His Glu  
 245 250 255  
 Leu Gln Leu Leu Thr Thr Phe Leu Phe Asn Val Gln Gly Thr Gln Pro  
 260 265 270  
 Lys Met Val Met Glu Tyr Trp Thr Gly Trp Phe Asp Ser Trp Gly Gly  
 275 280 285  
 Pro His Asn Ile Leu Asp Ser Ser Glu Val Leu Lys Thr Val Ser Ala  
 290 295 300  
 Ile Val Asp Ala Gly Ser Ser Ile Asn Leu Tyr Met Phe His Gly Gly  
 305 310 315 320  
 Thr Asn Phe Gly Phe Met Asn Gly Ala Met His Phe His Asp Tyr Lys

191/233

325	330	335
Ser Asp Val Thr Ser Tyr Asp Tyr Asp Ala Val Leu Thr Glu Ala Gly		
340	345	350
Asp Tyr Thr Ala Lys Tyr Met Lys Leu Arg Asp Phe Phe Gly Ser Ile		
355	360	365
Ser Gly Ile Pro Leu Pro Pro Pro Pro Asp Leu Leu Pro Lys Met Pro		
370	375	380
Tyr Glu Pro Leu Thr Pro Val Leu Tyr Leu Ser Leu Trp Asp Ala Leu		
385	390	395
Lys Tyr Leu Gly Glu Pro Ile Lys Ser Glu Lys Pro Ile Asn Met Glu		
405	410	415
Asn Leu Pro Val Asn Gly Gly Asn Gly Gln Ser Phe Gly Tyr Ile Leu		
420	425	430
Tyr Glu Thr Ser Ile Thr Ser Ser Gly Ile Leu Ser Gly His Val His		
435	440	445
Asp Arg Gly Gln Val Phe Val Asn Thr Val Ser Ile Gly Phe Leu Asp		
450	455	460
Tyr Lys Thr Thr Lys Ile Ala Val Pro Leu Ile Gln Gly Tyr Thr Val		
465	470	475
Leu Arg Ile Leu Val Glu Asn Arg Gly Arg Val Asn Tyr Gly Glu Asn		
485	490	495
Ile Asp Asp Gln Arg Lys Gly Leu Ile Gly Asn Leu Tyr Leu Asn Asp		
500	505	510
Ser Pro Leu Lys Asn Phe Arg Ile Tyr Ser Leu Asp Met Lys Lys Ser		
515	520	525
Phe Phe Gln Arg Phe Gly Leu Asp Lys Trp Ser Ser Leu Pro Glu Thr		
530	535	540
Pro Thr Leu Pro Ala Phe Phe Leu Gly Ser Leu Ser Ile Ser Ser Thr		
545	550	555
Pro Cys Asp Thr Phe Leu Lys Leu Glu Gly Trp Glu Lys Gly Val Val		
565	570	575
Phe Ile Asn Gly Gln Asn Leu Gly Arg Tyr Trp Asn Ile Gly Pro Gln		
580	585	590
Lys Thr Leu Tyr Leu Pro Gly Pro Trp Leu Ser Ser Gly Ile Asn Gln		
595	600	605

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Val Ile Val Phe Glu Glu Thr Met Ala Gly Pro Ala Leu Gln Phe Thr

610

615

620

Glu Thr Pro His Leu Gly Arg Asn Gln Tyr Ile Lys

625

630

635

&lt;210&gt; 122

&lt;211&gt; 318

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 122

Met Val Glu Leu Met Phe Pro Leu Leu Leu Leu Leu Leu Pro Phe Leu

1

5

10

15

Leu Tyr Met Ala Ala Pro Gln Ile Arg Lys Met Leu Ser Ser Gly Val

20

25

30

Cys Thr Ser Thr Val Gln Leu Pro Gly Lys Val Val Val Val Thr Gly

35

40

45

Ala Asn Thr Gly Ile Gly Lys Glu Thr Ala Lys Glu Leu Ala Gln Arg

50

55

60

Gly Ala Arg Val Tyr Leu Ala Cys Arg Asp Val Glu Lys Gly Glu Leu

65

70

75

80

Val Ala Lys Glu Ile Gln Thr Thr Thr Gly Asn Gln Gln Val Leu Val

85

90

95

Arg Lys Leu Asp Leu Ser Asp Thr Lys Ser Ile Arg Ala Phe Ala Lys

100

105

110

Gly Phe Leu Ala Glu Glu Lys His Leu His Val Leu Ile Asn Asn Ala

115

120

125

Gly Val Met Met Cys Pro Tyr Ser Lys Thr Ala Asp Gly Phe Glu Met

130

135

140

His Ile Gly Val Asn His Leu Gly His Phe Leu Leu Thr His Leu Leu

145

150

155

160

Leu Glu Lys Leu Lys Glu Ser Ala Pro Ser Arg Ile Val Asn Val Ser

165

170

175

Ser Leu Ala His His Leu Gly Arg Ile His Phe His Asn Leu Gln Gly

180

185

190

Glu Lys Phe Tyr Asn Ala Gly Leu Ala Tyr Cys His Ser Lys Leu Ala

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195	200	205
Asn Ile Leu Phe Thr Gln Glu Leu Ala Arg Arg Leu Lys Gly Ser Gly		
210	215	220
Val Thr Thr Tyr Ser Val His Pro Gly Thr Val Gln Ser Glu Leu Val		
225	230	235
Arg His Ser Ser Phe Met Arg Trp Met Trp Trp Leu Phe Ser Phe Phe		
245	250	255
Ile Lys Thr Pro Gln Gln Gly Ala Gln Thr Ser Leu His Cys Ala Leu		
260	265	270
Thr Glu Gly Leu Glu Ile Leu Ser Gly Asn His Phe Ser Asp Cys His		
275	280	285
Val Ala Trp Val Ser Ala Gln Ala Arg Asn Glu Thr Ile Ala Arg Arg		
290	295	300
Leu Trp Asp Val Ser Cys Asp Leu Leu Gly Leu Pro Ile Asp		
305	310	315

&lt;210&gt; 123

&lt;211&gt; 82

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 123

Met Ala Phe Thr Leu Tyr Ser Leu Leu Gln Ala Ala Leu Leu Cys Val
1 5 10 15
Asn Ala Ile Ala Val Leu His Glu Glu Arg Phe Leu Lys Asn Ile Gly
20 25 30
Trp Gly Thr Asp Gln Gly Ile Gly Gly Phe Gly Glu Glu Pro Gly Ile
35 40 45
Lys Ser Gln Leu Met Asn Leu Ile Arg Ser Val Arg Thr Val Met Arg
50 55 60
Val Pro Leu Ile Ile Val Asn Ser Ile Ala Ile Val Leu Leu Leu Leu
65 70 75 80
Phe Gly

&lt;210&gt; 124

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&lt;211&gt; 247

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 124

Met His Leu Ala Arg Leu Val Gly Ser Cys Ser Leu Leu Leu Leu Leu  
1 5 10 15  
Gly Ala Leu Ser Gly Trp Ala Ala Ser Asp Asp Pro Ile Glu Lys Val  
20 25 30  
Ile Glu Gly Ile Asn Arg Gly Leu Ser Asn Ala Glu Arg Glu Val Gly  
35 40 45  
Lys Ala Leu Asp Gly Ile Asn Ser Gly Ile Thr His Ala Gly Arg Glu  
50 55 60  
Val Glu Lys Val Phe Asn Gly Leu Ser Asn Met Gly Ser His Thr Gly  
65 70 75 80  
Lys Glu Leu Asp Lys Gly Val Gln Gly Leu Asn His Gly Met Asp Lys  
85 90 95  
Val Ala His Glu Ile Asn His Gly Ile Gly Gln Ala Gly Lys Glu Ala  
100 105 110  
Glu Lys Leu Gly His Gly Val Asn Asn Ala Ala Gly Gln Ala Gly Lys  
115 120 125  
Glu Ala Asp Lys Ala Val Gln Gly Phe His Thr Gly Val His Gln Ala  
130 135 140  
Gly Lys Glu Ala Glu Lys Leu Gly Gln Gly Val Asn His Ala Ala Asp  
145 150 155 160  
Gln Ala Gly Lys Glu Val Glu Lys Leu Gly Gln Gly Ala His His Ala  
165 170 175  
Ala Gly Gln Ala Gly Lys Glu Leu Gln Asn Ala His Asn Gly Val Asn  
180 185 190  
Gln Ala Ser Lys Glu Ala Asn Gln Leu Leu Asn Gly Asn His Gln Ser  
195 200 205  
Gly Ser Ser Ser His Gln Gly Gly Ala Thr Thr Thr Pro Leu Ala Ser  
210 215 220  
Gly Ala Ser Val Asn Thr Pro Phe Ile Asn Leu Pro Ala Leu Trp Arg  
225 230 235 240  
Ser Val Ala Asn Ile Met Pro

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245

&lt;210&gt; 125

&lt;211&gt; 206

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 125

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Met Ala Pro Ser His Leu Ser Val Arg Glu Met Arg Glu Asp Glu Lys
  1             5             10             15
Pro Leu Val Leu Glu Met Leu Lys Ala Gly Val Lys Asp Thr Glu Asn
             20             25             30
Arg Val Ala Leu His Ala Leu Thr Arg Pro Pro Ala Leu Leu Leu Leu
             35             40             45
Ala Ala Ala Ser Ser Gly Leu Arg Phe Val Leu Ala Ser Phe Ala Leu
             50             55             60
Ala Leu Leu Leu Pro Val Phe Leu Ala Val Ala Ala Val Lys Leu Gly
             65             70             75             80
Leu Arg Ala Arg Trp Gly Ser Leu Pro Pro Pro Gly Gly Leu Gly Gly
             85             90             95
Pro Trp Val Ala Val Arg Gly Ser Gly Asp Val Cys Gly Val Leu Ala
             100            105            110
Leu Ala Pro Gly Thr Asn Ala Gly Asp Gly Ala Arg Val Thr Arg Leu
             115            120            125
Ser Val Ser Arg Trp His Arg Arg Arg Gly Val Gly Arg Arg Leu Leu
             130            135            140
Ala Phe Ala Glu Ala Arg Ala Arg Ala Trp Ala Gly Gly Met Gly Glu
             145            150            155            160
Pro Arg Ala Arg Leu Val Val Pro Val Ala Val Ala Ala Trp Gly Val
             165            170            175
Gly Gly Met Leu Glu Gly Cys Gly Tyr Gln Ala Glu Gly Gly Trp Gly
             180            185            190
Cys Leu Gly Tyr Thr Leu Val Arg Glu Phe Ser Lys Asp Leu
             195            200            205

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&lt;210&gt; 126



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&lt;211&gt; 432

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 126

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Met Asp Ala Arg Trp Trp Ala Val Val Val Leu Ala Ala Phe Pro Ser
  1              5              10              15
Leu Gly Ala Gly Gly Glu Thr Pro Glu Ala Pro Pro Glu Ser Trp Thr
      20              25              30
Gln Leu Trp Phe Phe Arg Phe Val Val Asn Ala Ala Gly Tyr Ala Ser
      35              40              45
Phe Met Val Pro Gly Tyr Leu Leu Val Gln Tyr Phe Arg Arg Lys Asn
      50              55              60
Tyr Leu Glu Thr Gly Arg Gly Leu Cys Phe Pro Leu Val Lys Ala Cys
      65              70              75              80
Val Phe Gly Asn Glu Pro Lys Ala Ser Asp Glu Val Pro Leu Ala Pro
      85              90              95
Arg Thr Glu Ala Ala Glu Thr Thr Pro Met Trp Gln Ala Leu Lys Leu
      100             105             110
Leu Phe Cys Ala Thr Gly Leu Gln Val Ser Tyr Leu Thr Trp Gly Val
      115             120             125
Leu Gln Glu Arg Val Met Thr Arg Ser Tyr Gly Ala Thr Ala Thr Ser
      130             135             140
Pro Gly Glu Arg Phe Thr Asp Ser Gln Phe Leu Val Leu Met Asn Arg
      145             150             155             160
Val Leu Ala Leu Ile Val Ala Gly Leu Ser Cys Val Leu Cys Lys Gln
      165             170             175
Pro Arg His Gly Ala Pro Met Tyr Arg Tyr Ser Phe Ala Ser Leu Ser
      180             185             190
Asn Val Leu Ser Ser Trp Cys Gln Tyr Glu Ala Leu Lys Phe Val Ser
      195             200             205
Phe Pro Thr Gln Val Leu Ala Lys Ala Ser Lys Val Ile Pro Val Met
      210             215             220
Leu Met Gly Lys Leu Val Ser Arg Arg Ser Tyr Glu His Trp Glu Tyr
      225             230             235             240
Leu Thr Ala Thr Leu Ile Ser Ile Gly Val Ser Met Phe Leu Leu Ser

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	245		250		255
Ser Gly Pro Glu Pro Arg Ser Ser Pro Ala Thr Thr Leu Ser Gly Leu					
	260		265		270
Ile Leu Leu Ala Gly Tyr Ile Ala Phe Asp Ser Phe Thr Ser Asn Trp					
	275		280		285
Gln Asp Ala Leu Phe Ala Tyr Lys Met Ser Ser Val Gln Met Met Phe					
	290		295		300
Gly Val Asn Phe Phe Ser Cys Leu Phe Thr Val Gly Ser Leu Leu Glu					
	305		310		315
Gln Gly Ala Leu Leu Glu Gly Thr Arg Phe Met Gly Arg His Ser Glu					
	325		330		335
Phe Ala Ala His Ala Leu Leu Leu Ser Ile Cys Ser Ala Cys Gly Gln					
	340		345		350
Leu Phe Ile Phe Tyr Thr Ile Gly Gln Phe Gly Ala Ala Val Phe Thr					
	355		360		365
Ile Ile Met Thr Leu Arg Gln Ala Phe Ala Ile Leu Leu Ser Cys Leu					
	370		375		380
Leu Tyr Gly His Thr Val Thr Val Val Gly Gly Leu Gly Val Ala Val					
	385		390		395
Val Phe Ala Ala Leu Leu Leu Arg Val Tyr Ala Arg Gly Arg Leu Lys					
	405		410		415
Gln Arg Gly Lys Lys Ala Val Pro Val Glu Ser Pro Val Gln Lys Val					
	420		425		430

&lt;210&gt; 127

&lt;211&gt; 306

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 127

Met Gly His Arg Thr Leu Val Leu Pro Trp Val Leu Leu Thr Leu Cys			
1	5	10	15
Val Thr Ala Gly Thr Pro Glu Val Trp Val Gln Val Arg Met Glu Ala			
20	25	30	
Thr Glu Leu Ser Ser Phe Thr Ile Arg Cys Gly Phe Leu Gly Ser Gly			
35	40	45	

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Ser Ile Ser Leu Val Thr Val Ser Trp Gly Gly Pro Asp Gly Ala Gly  
 50 55 60  
 Gly Thr Thr Leu Ala Val Leu His Pro Glu Arg Gly Ile Arg Gln Trp  
 65 70 75 80  
 Ala Pro Ala Arg Gln Ala Arg Trp Glu Thr Gln Ser Ser Ile Ser Leu  
 85 90 95  
 Ile Leu Glu Gly Ser Gly Ala Ser Ser Pro Cys Ala Asn Thr Thr Phe  
 100 105 110  
 Cys Cys Lys Phe Ala Ser Phe Pro Glu Gly Ser Trp Glu Ala Cys Gly  
 115 120 125  
 Ser Leu Pro Pro Ser Ser Asp Pro Gly Leu Ser Ala Pro Pro Thr Pro  
 130 135 140  
 Ala Pro Ile Leu Arg Ala Asp Leu Ala Gly Ile Leu Gly Val Ser Gly  
 145 150 155 160  
 Val Leu Leu Phe Gly Cys Val Tyr Leu Leu His Leu Leu Arg Arg His  
 165 170 175  
 Lys His Arg Pro Ala Pro Arg Leu Gln Pro Ser Arg Thr Ser Pro Gln  
 180 185 190  
 Ala Pro Arg Ala Arg Ala Trp Ala Pro Ser Gln Ala Ser Gln Ala Ala  
 195 200 205  
 Leu His Val Pro Tyr Ala Thr Ile Asn Thr Ser Cys Arg Pro Ala Thr  
 210 215 220  
 Leu Asp Thr Ala His Pro His Gly Gly Pro Ser Trp Trp Ala Ser Leu  
 225 230 235 240  
 Pro Thr His Ala Ala His Arg Pro Gln Gly Pro Ala Ala Trp Ala Ser  
 245 250 255  
 Thr Pro Ile Pro Ala Arg Gly Ser Phe Val Ser Val Glu Asn Gly Leu  
 260 265 270  
 Tyr Ala Gln Ala Gly Glu Arg Pro Pro His Thr Gly Pro Gly Leu Thr  
 275 280 285  
 Leu Phe Pro Asp Pro Arg Gly Pro Arg Ala Met Glu Gly Pro Leu Gly  
 290 295 300  
 Val Arg  
 305

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&lt;210&gt; 128

&lt;211&gt; 555

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 128

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Met Gln Ser Cys Glu Ser Ser Gly Asp Ser Ala Asp Asp Pro Leu Ser
  1              5              10              15
Arg Gly Leu Arg Arg Arg Gly Gln Pro Arg Val Val Val Ile Gly Ala
      20              25              30
Gly Leu Ala Gly Leu Ala Ala Ala Lys Ala Leu Leu Glu Gln Gly Phe
      35              40              45
Thr Asp Val Thr Val Leu Glu Ala Ser Ser His Ile Gly Gly Arg Val
      50              55              60
Gln Ser Val Lys Leu Gly His Ala Thr Phe Glu Leu Gly Ala Thr Trp
      65              70              75              80
Ile His Gly Ser His Gly Asn Pro Ile Tyr His Leu Ala Glu Ala Asn
      85              90              95
Gly Leu Leu Glu Glu Thr Thr Asp Gly Glu Arg Ser Val Gly Arg Ile
      100             105             110
Ser Leu Tyr Ser Lys Asn Gly Val Ala Cys Tyr Leu Thr Asn His Gly
      115             120             125
Arg Arg Ile Pro Lys Asp Val Val Glu Glu Phe Ser Asp Leu Tyr Asn
      130             135             140
Glu Val Tyr Asn Leu Thr Gln Glu Phe Phe Arg His Asp Lys Pro Val
      145             150             155             160
Asn Ala Glu Ser Gln Asn Ser Val Gly Val Phe Thr Arg Glu Glu Val
      165             170             175
Arg Asn Arg Ile Arg Asn Asp Pro Asp Asp Pro Glu Ala Thr Lys Arg
      180             185             190
Leu Lys Leu Ala Met Ile Gln Gln Tyr Leu Lys Val Glu Ser Cys Glu
      195             200             205
Ser Ser Ser His Ser Met Asp Glu Val Ser Leu Ser Ala Phe Gly Glu
      210             215             220
Trp Thr Glu Ile Pro Gly Ala His His Ile Ile Pro Ser Gly Phe Met
      225             230             235             240

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Arg Val Val Glu Leu Leu Ala Glu Gly Ile Pro Ala His Val Ile Gln  
 245 250 255  
 Leu Gly Lys Pro Val Arg Cys Ile His Trp Asp Gln Ala Ser Ala Arg  
 260 265 270  
 Pro Arg Gly Pro Glu Ile Glu Pro Arg Gly Glu Gly Asp His Asn His  
 275 280 285  
 Asp Thr Gly Glu Gly Gly Gln Gly Gly Glu Glu Pro Arg Gly Gly Arg  
 290 295 300  
 Trp Asp Glu Asp Glu Gln Trp Ser Val Val Val Glu Cys Glu Asp Cys  
 305 310 315 320  
 Glu Leu Ile Pro Ala Asp His Val Ile Val Thr Val Ser Leu Gly Val  
 325 330 335  
 Leu Lys Arg Gln Tyr Thr Ser Phe Phe Arg Pro Gly Leu Pro Thr Glu  
 340 345 350  
 Lys Val Ala Ala Ile His Arg Leu Gly Ile Gly Thr Thr Asp Lys Ile  
 355 360 365  
 Phe Leu Glu Phe Glu Glu Pro Phe Trp Gly Pro Glu Cys Asn Ser Leu  
 370 375 380  
 Gln Phe Val Trp Glu Asp Glu Ala Glu Ser His Thr Leu Thr Tyr Pro  
 385 390 395 400  
 Pro Glu Leu Trp Tyr Arg Lys Ile Cys Gly Phe Asp Val Leu Tyr Pro  
 405 410 415  
 Pro Glu Arg Tyr Gly His Val Leu Ser Gly Trp Ile Cys Gly Glu Glu  
 420 425 430  
 Ala Leu Val Met Glu Lys Cys Asp Asp Glu Ala Val Ala Glu Ile Cys  
 435 440 445  
 Thr Glu Met Leu Arg Gln Phe Thr Gly Asn Pro Asn Ile Pro Lys Pro  
 450 455 460  
 Arg Arg Ile Leu Arg Ser Ala Trp Gly Ser Asn Pro Tyr Phe Arg Gly  
 465 470 475 480  
 Ser Tyr Ser Tyr Thr Gln Val Gly Ser Ser Gly Ala Asp Val Glu Lys  
 485 490 495  
 Leu Ala Lys Pro Leu Pro Tyr Thr Glu Ser Ser Lys Thr Ala Pro Met  
 500 505 510  
 Gln Val Leu Phe Ser Gly Glu Ala Thr His Arg Lys Tyr Tyr Ser Thr

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515	520	525
Thr His Gly Ala Leu Leu Ser Gly Gln Arg Glu Ala Ala Arg Leu Ile		
530	535	540
Glu Met Tyr Arg Asp Leu Phe Gln Gln Gly Thr		
545	550	555

&lt;210&gt; 129

&lt;211&gt; 250

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 129

Met Gly Ser Gln His Ser Ala Ala Ala Arg Pro Ser Ser Cys Arg Arg		
1	5	10
Lys Gln Glu Asp Asp Arg Asp Gly Leu Leu Ala Glu Arg Glu Gln Glu		
20	25	30
Glu Ala Ile Ala Gln Phe Pro Tyr Val Glu Phe Thr Gly Arg Asp Ser		
35	40	45
Ile Thr Cys Leu Thr Cys Gln Gly Thr Gly Tyr Ile Pro Thr Glu Gln		
50	55	60
Val Asn Glu Leu Val Ala Leu Ile Pro His Ser Asp Gln Arg Leu Arg		
65	70	75
Pro Gln Arg Thr Lys Gln Tyr Val Leu Leu Ser Ile Leu Leu Cys Leu		
85	90	95
Leu Ala Ser Gly Leu Val Val Phe Phe Leu Phe Pro His Ser Val Leu		
100	105	110
Val Asp Asp Asp Gly Ile Lys Val Val Lys Val Thr Phe Asn Lys Gln		
115	120	125
Asp Ser Leu Val Ile Leu Thr Ile Met Ala Thr Leu Lys Ile Arg Asn		
130	135	140
Ser Asn Phe Tyr Thr Val Ala Val Thr Ser Leu Ser Ser Gln Ile Gln		
145	150	155
Tyr Met Asn Thr Val Val Ser Thr Tyr Val Thr Thr Asn Val Ser Leu		
165	170	175
Ile Pro Pro Arg Ser Glu Gln Leu Val Asn Phe Thr Gly Lys Ala Glu		
180	185	190

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Met Gly Gly Pro Phe Ser Tyr Val Tyr Phe Phe Cys Thr Val Pro Glu  
 195 200 205  
 Ile Leu Val His Asn Ile Val Ile Phe Met Arg Thr Ser Val Lys Ile  
 210 215 220  
 Ser Tyr Ile Gly Leu Met Thr Gln Ser Ser Leu Glu Thr His His Tyr  
 225 230 235 240  
 Val Asp Cys Gly Gly Asn Ser Thr Ala Ile  
 245 250

&lt;210&gt; 130

&lt;211&gt; 174

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 130

Met Gln Ala Pro Ala Phe Arg Asp Lys Lys Gln Gly Val Ser Ala Lys  
 1 5 10 15  
 Asn Gln Gly Ala His Asp Pro Asp Tyr Glu Asn Ile Thr Leu Ala Phe  
 20 25 30  
 Lys Asn Gln Asp His Ala Lys Gly Gly His Ser Arg Pro Thr Ser Gln  
 35 40 45  
 Val Pro Ala Gln Cys Arg Pro Pro Ser Asp Ser Thr Gln Val Pro Cys  
 50 55 60  
 Trp Leu Tyr Arg Ala Ile Leu Ser Leu Tyr Ile Leu Leu Ala Leu Ala  
 65 70 75 80  
 Phe Val Leu Cys Ile Ile Leu Ser Ala Phe Ile Met Val Lys Asn Ala  
 85 90 95  
 Glu Met Ser Lys Glu Leu Leu Gly Phe Lys Arg Glu Leu Trp Asn Val  
 100 105 110  
 Ser Asn Ser Val Gln Ala Cys Glu Glu Arg Gln Lys Arg Gly Trp Asp  
 115 120 125  
 Ser Val Gln Gln Ser Ile Thr Met Val Arg Ser Lys Ile Asp Arg Leu  
 130 135 140  
 Glu Thr Thr Leu Ala Gly Ile Lys Asn Ile Asp Thr Lys Val Gln Lys  
 145 150 155 160  
 Ile Leu Glu Val Leu Gln Lys Met Pro Gln Ser Ser Pro Gln

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165

170

&lt;210&gt; 131

&lt;211&gt; 1908

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 131

atgaccacgt ggagcctccg gcggaggccg gcccgcacgc tgggactcct gctgctggtc	60
gtcttgggct tcttgggtgt tcgcaggetg gactggagca ccctgggtccc tctgcggtcc	120
cgccatcgac agctggggct gcaggccag ggctggaaact tcatgctgga ggattccacc	180
ttctggatct tcgggggctc catccactat ttccgtgtgc ccaggagta ctggaggagac	240
cgcctgctga agatgaaggg ctgtggcttg aacaccctca ccacctatgt tccgtggaac	300
ctgcatgagc cagaaagagg caaatttgac ttctctggga acctggacct ggaggccttc	360
gtctgatgg ccgcagagat cgggctgtgg gtgattctgc gtccaggccc ctacatctgc	420
agtgagatgg acctcggggg cttgccacgc tggctaactcc aagacctgg catgaggctg	480
aggacaactt acaagggtct caccgaagca gtggaccttt attttgacca cctgatgtcc	540
aggggtgggc cactccagta caagcgtggg ggacctatca ttgccgtgca ggtggagaat	600
gaatatggtt cctataataa agaccccgca tacatgccct acgtcaagaa ggcactggag	660
gacctgggca ttgtggaact gctcctgact tcagacaaca aggatgggct gagcaagggg	720
attgtccagg gagtcttggc caccatcaac ttgcagtcaa cacacgagct gcagctactg	780
accacctttc tcttcaacgt ccaggggact cagcccaaga tggatgagga gtactggacg	840
gggtggtttg actcgtgggg aggccctcac aatatcttgg attcttctga ggttttgaaa	900
acctgtctg ccattgtgga cgcgggtcc tccatcaacc tctacatgtt ccacggaggc	960
accaactttg gcttcatgaa tggagccatg cacttccatg actacaagtc agatgtcacc	1020
agctatgact atgatgctgt gctgacagaa gccggcgatt acacggccaa gtacatgaag	1080
cttcgagact tcttcggctc catctcaggc atccctctcc ctccccacc tgaccttctt	1140
cccaagatgc cgtatgagcc cttaacgcca gtcttgtacc tgtctctgtg ggacgccctc	1200
aagtacctgg gggagccaat caagtctgaa aagcccatca acatggagaa cctgccagtc	1260
aatgggggaa atggacagtc cttcgggtac attctctatg agaccagcat cacctcgtct	1320
ggcatcctca gtggccacgt gcatgatcgg gggcagggtg ttgtgaacac agtatccata	1380
ggattcttgg actacaagac aacgaagatt gctgtccccc tgatccaggg ttacacctg	1440
ctgaggatct tgggtggagaa tcgtgggcga gtcaactatg gggagaatat tgatgaccag	1500
cgcaaaggct taattggaaa tctctatctg aatgattcac ccctgaaaaa cttcagaatc	1560
tatagcctgg atatgaagaa gagcttcttt cagaggttcg gcctggacaa atggagtcc	1620
ctcccagaaa caccacatt acctgcttcc ttcttgggta gcttgtccat cagctccacc	1680



204/233

ccttgtgaca cctttctgaa gctggagggc tgggagaagg gggttgtatt catcaatggc 1740  
 cagaaccttg gacgttactg gaacattgga cccagaaga cgctttacct cccaggccc 1800  
 tggttgagca gcggaatcaa ccaggtcacg gtttttgagg agacgatggc gggccctgca 1860  
 ttacagttca cggaaacccc ccacctgggc aggaaccagt acattaag 1908

&lt;210&gt; 132

&lt;211&gt; 954

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 132

atggttgagc tcattgtccc gctgttgctc ctccctctgc ccttccttct gtatatggct 60  
 gcgccccaaa tcaggaaaat gctgtccagt ggggtgtgta catcaactgt tcagcttcc 120  
 gggaaagtag ttgtggtcac aggagctaat acaggatcgc ggaaggagac agccaaagag 180  
 ctggctcaga gaggagctcg agtatattta gcttgccggg atgtggaaaa gggggaattg 240  
 gtggccaaaag agatccagac cagcagaggg aaccagcagg tgttggtgcg gaaactggac 300  
 ctgtctgata ctaagtctat tcgagctttt gctaagggtc tcttagctga ggaaaagcac 360  
 ctccacgttt tgatcaacaa tgcaggagtg atgatgtgct cgtactcgaa gacagcagat 420  
 ggctttgaga tgcacatagg agtcaaccac ttgggtcact tcctccctaac ccactctgctg 480  
 ctagagaaac taaaggaatc agcccatca aggatagtaa atgtgtcttc cctcgcacat 540  
 cacctgggaa ggatccactt ccataacctg cagggcgaga aattctacaa tgcaggcctg 600  
 gcctactgtc acagcaagct agccaacatc ctcttcaccc aggaactggc ccggagacta 660  
 aaaggctctg gcgttacgac gtattctgta caccctggca cagtccaatc tgaactgggt 720  
 cggcactcat ctttcatgag atggatgtgg tggcttttct cctttttcat caagactcct 780  
 cagcagggag cccagaccag cctgcactgt gccttaacag aaggctctga gattctaagt 840  
 gggaaatcatt tcagtgaactg tcattgtgga tgggtctctg cccaagctcg taatgagact 900  
 atagcaaggc ggctgtggga cgtcagttgt gacctgctgg gcctcccaat agac 954

&lt;210&gt; 133

&lt;211&gt; 246

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 133

atggccttta cctgtactc actgctgcag gcagccctgc totgctcaa cgcctcgca 60  
 gtgctgcacg aggagcgatt cctcaagaac attggctggg gaacagacca ggggaattggt 120  
 ggatttggag aagagccggg aattaaatca cagctaataa accttattcg atctgtaaga 180

205/233

accgtgatga gagtgccatt gataatagta aactcaattg caattgtgtt acttttatta 240  
 tttgga 246

&lt;210&gt; 134

&lt;211&gt; 741

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 134

atgcaccttg cacgtctggt eggctcctgc tccctccttc tgetactggg ggccctgtct 60  
 ggatgggagg ccagcgatga cccattgag aaggtcattg aagggatcaa ccgagggctg 120  
 agcaatgcag agagagaggt gggcaaggcc ctggatggca tcaacagtgg aatcacgcat 180  
 gccggaaggg aagtggagaa ggttttcaac ggacttagca acatggggag ccacaccggc 240  
 aaggagtgg acaaaggcgt ccaggggctc aaccacggca tggacaagggt tgcccatgag 300  
 atcaaccatg gtattggaca agcaggaaag gaagcagaga agcttggcca tgggggtcaac 360  
 aacgctgctg gacaggccgg gaaggaagca gacaaagcgg tccaagggtt ccacactggg 420  
 gtccaccagg ctgggaagga agcagagaaa cttggccaag ggggtcaacca tgtgtctgac 480  
 caggctggaa aggaagtgga gaagcttggc caaggtgccc accatgtctg tggccaggcc 540  
 gggaaggagc tgcagaatgc tcataatggg gtcaaccaag ccagcaagga ggccaaccag 600  
 ctgctgaatg gcaaccatca aagcggatct tcagccatc aaggaggggc cacaaccacg 660  
 ccgttagcct ctggggcctc ggtcaacacg cctttcatca accttcccgc cctgtggagg 720  
 agcgtcgcca acatcatgcc c 741

&lt;210&gt; 135

&lt;211&gt; 618

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 135

atggcccca gccacctgtc agtgcgggag atgagggaaag atgagaagcc cctggtgctg 60  
 gagatgctga aggcgggctg gaaggacacg gaaaaccgag tggccctcca tgccttgaca 120  
 cggccgcccg ccctgctcct cctggcggcg gccagcagcg gcctgcgctt tgcctggct 180  
 tccttcgccc tggccctcct cctgcgggtg ttcttggtg tggccgcccga gaagctgggc 240  
 ctgcggggcc gatggggctc gctgcctccg ccgggtggcc tggggggccc ctgggtggcc 300  
 gtgcggggct ccggtgacgt gtgtggggtc ctggctctgg cccctggcac aaatgcaggg 360  
 gacggggccc gggtcacccg cctgtctgtc tctcgtggc accgcgcgcg gggcgtgggc 420  
 aggaggtgc tggccttcgc ggagggcccg gctcgggcct gggctggggg catgggggag 480

206/233

ccccggggccc ggctcgtggt ccccggtggct gtggccgcct ggggggtggg agggatgctg 540  
 gagggctgtg gctaccaggc cgaggggggc tggggctgcc tgggtacac gctggtgagg 600  
 gaattcagca aagacctg 618

&lt;210&gt; 136

&lt;211&gt; 1296

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 136

atggacgcca gatggtgggc agtgggtggtg ctggctgcgt tccccccct aggggcaggt 60  
 ggggagactc ccgaagcccc tccggagtca tggaccacgc tatggttctt ccgatttgtg 120  
 gtgaatgctg ctggctatgc cagctttatg gtacctggct acctcctggt gcagtaactc 180  
 aggcggaaga actacctgga gaccggtagg ggccctctgt tccccctggt gaaagcttgt 240  
 gtgtttggca atgagcccaa ggccctctgat gaggttcccc tggcgccccg aacagaggcg 300  
 gcagagacca ccccgatgtg gcaggccctg aagctgctct tctgtgccac agggctccag 360  
 gtgtcttacc tgacttgggg tgtgctgcag gaaagagtga tgaccgcag ctatggggcc 420  
 acagccacat caccgggtga gcgctttacg gactcgcagt tcctgggtgt aatgaaccga 480  
 gtgctggcac tgattgtggc tggccctctcc tgtgttctct gcaagcagcc ccggcatggg 540  
 gcacccatgt accggtactc ctttgccagc ctgtccaatg tcttagcag ctggtgccaa 600  
 tacgaagctc ttaagttcgt cagcttcccc acccaggtgc tggccaaggc ctctaagggtg 660  
 atccctgtca tgcctgatgg aaagcttgtg tctcggcgca gctacgaaca ctgggagtac 720  
 ctgacagcca cactcatctc cattgggggtc agcatgttcc tctatccag cggaccagag 780  
 ccccgagct cccagccac cacactctca ggccctcatct tactggcagg ttatattgct 840  
 tttgacagct tcacctcaaa ctggcaggat gccctgtttg cctataagat gtcacgggtg 900  
 cagatgatgt ttggggtaaa tttctctctc tgcctcttca cagtgggctc actgctagaa 960  
 cagggggccc tactggaggg aaccgcttc atggggcgac acagtgagtt tgctgcccat 1020  
 gccctgtac tctccatctg ctccgcctgt ggccagctct tcatctttta caccattggg 1080  
 cagtttgggg ctgccgtctt caccatcatc atgaccctcc gccaggcctt tgccatcctt 1140  
 ctttcctgac ttctctatgg ccacactgtc actgtggtgg gagggctggg ggtggtgtg 1200  
 gtctttgctg cctcctgct cagagtctac gcgcggggcc gtctaaagca acggggaaag 1260  
 aaggctgtgc ctgttgagtc tcctgtgcag aaggtt 1296

&lt;210&gt; 137

&lt;211&gt; 918

&lt;212&gt; DNA

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&lt;213&gt; Homo sapiens

&lt;400&gt; 137

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atggggcacc ggaccctggt cctgccctgg gtgetgctga cettgtgtgt caetgcgggg    60
accccgaggg tgtgggttca agttcggatg gaggccaccg agctctcgtc cttoaccatc    120
cgttgtgggt tcctggggtc tggctccatc tccctggtga ctgtgagctg ggggggcccc    180
gacggtgctg gggggaccac gctggctgtg ttgacccag aacgtggcat ccggcaatgg    240
gcccctgctc gccaggcccc ctgggaaacc cagagcagca tctctctcat cctggaaggc    300
tctggggcca gcagccctg cgccaacacc accttctgct gcaagtttgc gtccttccct    360
gagggtcctt gggaggcctg tgggagcctc ccgccagct cagaccaggg gctctctgcc    420
ccgcgcactc ctgcccccat tctgcgggca gacctggccg ggatcttggg ggtctcagga    480
gtcctcctct ttggctgtgt ctacctcctt catctgctgc gccgacataa gcaccgccct    540
gcccttaggc tccagccgtc ccgcaccagc cccagggcac cgagagcacg agcatgggca    600
ccaagccagg cctcccaggc tgcctttcac gtcccttatg ccactatcaa caccagctgc    660
cgccagctca ctttgacac agctcaccct catggggggc cgtcctggtg ggcgtcactc    720
ccccccacg ctgcacacgg gccccagggc cctgcgcctt gggcctccac acccatccct    780
gcacgtggca gctttgtctc tgttgagaat ggactctacg ctgaggcagg ggagaggcct    840
ctcacactg gtcccgccct cactcttttc cctgaccctc gggggcccag ggccatggaa    900
ggacccttag gagttcga                                     918

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&lt;210&gt; 138

&lt;211&gt; 1665

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 138

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atgcaaagtt gtgaatccag tggtgacagt ggggatgacc ctctcagtcg cggcctacgg    60
agaagggggc agcctcgtgt ggtggtgatc ggcgcgggct tggctggcct ggctgcagcc    120
aaagcacttc ttgagcaggg ttacacggat gtcactgtgc ttgaggcttc cagccacatc    180
ggaggccgtg tgagagtggt gaaacttgga cagccacact ttgagctggg agccacctgg    240
atccatggct cccatgggaa ccctatctat catctagcag aagccaacgg cctcctggaa    300
gagacaaccg atggggaacg cagcgtgggc cgcacagcc tctattccaa gaatggcgtg    360
gcctgctacc ttaccaacca cggcgcagg atccccagg acgtggttga ggaattcagc    420
gatttataca acgaggtcta taacttgacc caggagtctt tccggcacga taaaccagtc    480
aatgctgaaa gtcaaaatag cgtgggggtg ttcaccgag aggaggtgcg taaccgcac    540
aggaatgacc ctgacgacct agaggctacc aagcgccctg agctcgccat gatccagcag    600
tacctgaagg tggagagctg tgagagcagc tcacacagca tggacgaggt gtccttgagc    660

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208/233

gccttcgggg agtggaccga gatccccggc gctcaccaca tcatccctc gggcttcatg 720  
 cgggttggtg agctgctggc ggagggcac cctgcccacg tcatccagct agggaaacct 780  
 gtccgctgca ttcactggga ccaggcctca gcccgcacca gaggcctga gattgagccc 840  
 cggggtgagg gcgaccacaa tcacgacaat ggggaggggtg gccaggggtg agaggagccc 900  
 cgggggggca ggtgggatga ggatgagcag tggtcgggtg tggtgagtg cgaggactgt 960  
 gagctgatcc cggcggacca tgtgattgtg accgtgtcgc taggtgtgct aaagaggcag 1020  
 tacaccagtt tcttcgggcc aggcctgccc acagagaagg tggctgccat ccaccgcctg 1080  
 ggcattggca ccaccgacaa gatctttctg gaattcgagg agcccttctg gggccctgag 1140  
 tgcaacagcc tacagtttgt gtgggaggac gaagcggaga gccacaccct cactaccca 1200  
 cctgagctct ggtaccgcaa gatctgcggc tttgatgtcc tctaccgcgc tgagcgctac 1260  
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 gacgaggcag tggcggagat ctgcacggag atgtgcgtc agttcacagg gaacccaac 1380  
 attccaaaac ctggcggaat cttgcgtcgc gcctggggca gcaaccctta cttccgcggc 1440  
 tcctattcat acacgcaggc gggctccagc gggcgggatg tggagaagct ggccaagccc 1500  
 ctgccgtaca cggagagctc aaagacagcg cccatgcagg tgcgttttc cggtgaggcc 1560  
 acccaccgca agtactatc caccacccac ggtgtctcgc tgtccggcca gcgtgaggct 1620  
 gcccgctca ttgagatgta ccgagacctc ttccagcagg ggacc 1665

&lt;210&gt; 139

&lt;211&gt; 750

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 139

atgggggtctc agcattccgc tgcgtctcgc ccctcctcct gcaggcgaaa gcaagaagat 60  
 gacaggggacg gtttgctggc tgaacgagag caggagaag ccattgctca gtcccatat 120  
 gtggaattca ccgggagaga tagcatcacc tgtctcacgt gccaggggac aggctacatt 180  
 ccaacagagc aagtaaatga gttggtggct ttgatccac acagtgatca gagattgcgc 240  
 cctcagcgaa ctaagcaata tgcctcctg tccatcctgc tttgtctcct ggcattctgt 300  
 ttggtggttt tcttcctggt tccgattca gtccttggtg atgatgacgg catcaaagtg 360  
 gtgaaagtca catttaataa gcaagactcc cttgtaattc tcaccatcat ggccacctg 420  
 aaaatcagga actccaactt ctacacgggtg gcagtgacca gcctgtccag ccagattcag 480  
 tacatgaaca cagtggtcag tacatatgtg actactaacg tctcccttat tccacctcg 540  
 agtgagcaac tggatgaattt taccgggaag gccgagatgg gaggaccgtt ttccatgtg 600  
 tactttctct gcacggtacc tgagatcctg gtgcacaaca tagtgatctt catgcgaact 660  
 tcagtgaaga ttcatatcat tggcctcatg acccagagct ccttgagagc acatcactat 720

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gtggattgtg gaggaattc cacagctatt

750

&lt;210&gt; 140

&lt;211&gt; 522

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 140

atgcaagcac cagccttcag ggacaagaaa caggggggtct cagccaagaa tcaagggtgcc	60
catgaccacag actatgagaa tatcaccttg gccttcaaaa atcaggacca tgcaaagggt	120
ggtcattcac gaccacagag ccaagtccca gccagtgca ggccgccctc agactccacc	180
cagggtccct gctggttgta cagagccatc ctgagcctgt acatcctcct ggccctggcc	240
tttgtcctct gcatcctcct gtcagccttc atcatggtga agaattgtga gatgtccaag	300
gagctgctgg gctttaaaag ggagctttgg aatgtctcaa actccgtaca agcatgcgaa	360
gagagacaga agagaggctg ggattccgtt cagcagagca tcaccatggt caggagcaag	420
attgatagat tagagacgac attagcaggc ataaaaaaca ttgacacaaa ggtacagaaa	480
atcttgagg tgctgcagaa aatgccacag tctcacctc aa	522

&lt;210&gt; 141

&lt;211&gt; 3234

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (129)...(2039)

&lt;400&gt; 141

aatgagcgcc ggcgggccgg ttgccaggc gaccagcgcg cggtccgcc cccgcggcg	60
aggctccgc gcgcggctga gtgcggactg gagggggaac ccgggtccc gcgcttagag	120
aacacgcg atg acc acg tgg agc ctc cgg cgg agg ccg gcc cgc acg ctg	170
Met Thr Thr Trp Ser Leu Arg Arg Arg Pro Ala Arg Thr Leu	
1 5 10	
gga ctc ctg ctg ctg gtc gtc ttg ggc ttc ctg gtg ctt cgc agg ctg	218
Gly Leu Leu Leu Leu Val Val Leu Gly Phe Leu Val Leu Arg Arg Leu	
15 20 25 30	
gac tgg agc acc ctg gtc cct ctg cgg ctc cgc cat cga cag ctg ggg	266
Asp Trp Ser Thr Leu Val Pro Leu Arg Leu Arg His Arg Gln Leu Gly	

## 210/233

35	40	45	
ctg cag gcc aag ggc tgg aac ttc atg ctg gag gat tcc acc ttc tgg			314
Leu Gln Ala Lys Gly Trp Asn Phe Met Leu Glu Asp Ser Thr Phe Trp			
50	55	60	
atc ttc ggg ggc tcc atc cac tat ttc cgt gtg ccc agg gag tac tgg			362
Ile Phe Gly Gly Ser Ile His Tyr Phe Arg Val Pro Arg Glu Tyr Trp			
65	70	75	
agg gac cgc ctg ctg aag atg aag gcc tgt ggc ttg aac acc ctc acc			410
Arg Asp Arg Leu Leu Lys Met Lys Ala Cys Gly Leu Asn Thr Leu Thr			
80	85	90	
acc tat gtt ccg tgg aac ctg cat gag cca gaa aga ggc aaa ttt gac			458
Thr Tyr Val Pro Trp Asn Leu His Glu Pro Glu Arg Gly Lys Phe Asp			
95	100	105	110
ttc tct ggg aac ctg gac ctg gag gcc ttc gtc ctg atg gcc gca gag			506
Phe Ser Gly Asn Leu Asp Leu Glu Ala Phe Val Leu Met Ala Ala Glu			
115	120	125	
atc ggg ctg tgg gtg att ctg cgt cca ggc ccc tac atc tgc agt gag			554
Ile Gly Leu Trp Val Ile Leu Arg Pro Gly Pro Tyr Ile Cys Ser Glu			
130	135	140	
atg gac ctc ggg ggc ttg ccc agc tgg cta ctc caa gac cct ggc atg			602
Met Asp Leu Gly Gly Leu Pro Ser Trp Leu Leu Gln Asp Pro Gly Met			
145	150	155	
agg ctg agg aca act tac aag ggc ttc acc gaa gca gtg gac ctt tat			650
Arg Leu Arg Thr Thr Tyr Lys Gly Phe Thr Glu Ala Val Asp Leu Tyr			
160	165	170	
ttt gac cac ctg atg tcc agg gtg gtg cca ctc cag tac aag cgt ggg			698
Phe Asp His Leu Met Ser Arg Val Val Pro Leu Gln Tyr Lys Arg Gly			
175	180	185	190
gga cct atc att gcc gtg cag gtg gag aat gaa tat ggt tcc tat aat			746
Gly Pro Ile Ile Ala Val Gln Val Glu Asn Glu Tyr Gly Ser Tyr Asn			
195	200	205	
aaa gac ccc gca tac atg ccc tac gtc aag aag gca ctg gag gac cgt			794
Lys Asp Pro Ala Tyr Met Pro Tyr Val Lys Lys Ala Leu Glu Asp Arg			
210	215	220	
ggc att gtg gaa ctg ctc ctg act tca gac aac aag gat ggg ctg agc			842

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Gly Ile Val Glu Leu Leu Leu Thr Ser Asp Asn Lys Asp Gly Leu Ser	
225 230 235	
aag ggg att gtc cag gga gtc ttg gcc acc atc aac ttg cag tca aca	890
Lys Gly Ile Val Gln Gly Val Leu Ala Thr Ile Asn Leu Gln Ser Thr	
240 245 250	
cac gag ctg cag cta ctg acc acc ttt ctc ttc aac gtc cag ggg act	938
His Glu Leu Gln Leu Leu Thr Thr Phe Leu Phe Asn Val Gln Gly Thr	
255 260 265 270	
cag ccc aag atg gtg atg gag tac tgg acg ggg tgg ttt gac tcg tgg	986
Gln Pro Lys Met Val Met Glu Tyr Trp Thr Gly Trp Phe Asp Ser Trp	
275 280 285	
gga ggc cct cac aat atc ttg gat tct tct gag gtt ttg aaa acc gtg	1034
Gly Gly Pro His Asn Ile Leu Asp Ser Ser Glu Val Leu Lys Thr Val	
290 295 300	
tct gcc att gtg gac gcc ggc tcc tcc atc aac ctc tac atg ttc cac	1082
Ser Ala Ile Val Asp Ala Gly Ser Ser Ile Asn Leu Tyr Met Phe His	
305 310 315	
gga ggc acc aac ttt ggc ttc atg aat gga gcc atg cac ttc cat gac	1130
Gly Gly Thr Asn Phe Gly Phe Met Asn Gly Ala Met His Phe His Asp	
320 325 330	
tac aag tca gat gtc acc agc tat gac tat gat gct gtg ctg aca gaa	1178
Tyr Lys Ser Asp Val Thr Ser Tyr Asp Tyr Asp Ala Val Leu Thr Glu	
335 340 345 350	
gcc ggc gat tac acg gcc aag tac atg aag ctt cga gac ttc ttc ggc	1226
Ala Gly Asp Tyr Thr Ala Lys Tyr Met Lys Leu Arg Asp Phe Phe Gly	
355 360 365	
tcc atc tca ggc atc cct ctc cct ccc cca cct gac ctt ctt ccc aag	1274
Ser Ile Ser Gly Ile Pro Leu Pro Pro Pro Pro Asp Leu Leu Pro Lys	
370 375 380	
atg ccg tat gag ccc tta acg cca gtc ttg tac ctg tct ctg tgg gac	1322
Met Pro Tyr Glu Pro Leu Thr Pro Val Leu Tyr Leu Ser Leu Trp Asp	
385 390 395	
gcc ctc aag tac ctg ggg gag cca atc aag tct gaa aag ccc atc aac	1370
Ala Leu Lys Tyr Leu Gly Glu Pro Ile Lys Ser Glu Lys Pro Ile Asn	
400 405 410	



																	1418
atg	gag	aac	ctg	cca	gtc	aat	ggg	gga	aat	gga	cag	tcc	ttc	ggg	tac		
Met	Glu	Asn	Leu	Pro	Val	Asn	Gly	Gly	Asn	Gly	Gln	Ser	Phe	Gly	Tyr		
415	420						425						430				
att ctc tat gag acc agc atc acc tcg tct ggc atc ctc agt ggc cac																	1466
Ile	Leu	Tyr	Glu	Thr	Ser	Ile	Thr	Ser	Ser	Gly	Ile	Leu	Ser	Gly	His		
435						440						445					
gtg cat gat cgg ggg cag gtg ttt gtg aac aca gta tcc ata gga ttc																	1514
Val	His	Asp	Arg	Gly	Gln	Val	Phe	Val	Asn	Thr	Val	Ser	Ile	Gly	Phe		
450						455						460					
ttg gac tac aag aca acg aag att gct gtc ccc ctg atc cag ggt tac																	1562
Leu	Asp	Tyr	Lys	Thr	Thr	Lys	Ile	Ala	Val	Pro	Leu	Ile	Gln	Gly	Tyr		
465						470						475					
acc gtg ctg agg atc ttg gtg gag aat cgt ggg cga gtc aac tat ggg																	1610
Thr	Val	Leu	Arg	Ile	Leu	Val	Glu	Asn	Arg	Gly	Arg	Val	Asn	Tyr	Gly		
480						485						490					
gag aat att gat gac cag cgc aaa ggc tta att gga aat ctc tat ctg																	1658
Glu	Asn	Ile	Asp	Asp	Gln	Arg	Lys	Gly	Leu	Ile	Gly	Asn	Leu	Tyr	Leu		
495	500						505						510				
aat gat tca ccc ctg aaa aac ttc aga atc tat agc ctg gat atg aag																	1706
Asn	Asp	Ser	Pro	Leu	Lys	Asn	Phe	Arg	Ile	Tyr	Ser	Leu	Asp	Met	Lys		
515						520						525					
aag agc ttc ttt cag agg ttc ggc ctg gac aaa tgg agt tcc ctc cca																	1754
Lys	Ser	Phe	Phe	Gln	Arg	Phe	Gly	Leu	Asp	Lys	Trp	Ser	Ser	Leu	Pro		
530						535						540					
gaa aca ccc aca tta cct gct ttc ttc ttg ggt agc ttg tcc atc agc																	1802
Glu	Thr	Pro	Thr	Leu	Pro	Ala	Phe	Phe	Leu	Gly	Ser	Leu	Ser	Ile	Ser		
545						550						555					
tcc acc cct tgt gac acc ttt ctg aag ctg gag ggc tgg gag aag ggg																	1850
Ser	Thr	Pro	Cys	Asp	Thr	Phe	Leu	Lys	Leu	Glu	Gly	Trp	Glu	Lys	Gly		
560						565						570					
gtt gta ttc atc aat ggc cag aac ctt gga cgt tac tgg aac att gga																	1898
Val	Val	Phe	Ile	Asn	Gly	Gln	Asn	Leu	Gly	Arg	Tyr	Trp	Asn	Ile	Gly		
575	580						585						590				
ccc cag aag acg ctt tac ctc cca ggt ccc tgg ttg agc agc gga atc																	1946
Pro	Gln	Lys	Thr	Leu	Tyr	Leu	Pro	Gly	Pro	Trp	Leu	Ser	Ser	Gly	Ile		

213/233

595	600	605	
aac cag gtc atc gtt ttt gag gag acg atg gcg ggc cct gca tta cag			1994
Asn Gln Val Ile Val Phe Glu Glu Thr Met Ala Gly Pro Ala Leu Gln			
610	615	620	
ttc acg gaa acc ccc cac ctg ggc agg aac cag tac att aag tgag			2040
Phe Thr Glu Thr Pro His Leu Gly Arg Asn Gln Tyr Ile Lys			
625	630	635	
eggtggcacc ccctcctgct ggtgccagtg ggagactgcc gcctcctctt gacctgaagc			2100
ctggtggctg ctgccccacc cctcaactgca aaagcatctc cttaagtagc aacctcaggg			2160
actgggggct acagtctgcc cctgtctcag ctcaaaaccc taagcctgca gggaaaggtg			2220
ggatggetct gggcctgget ttgttgatga tggttttcct acagccctgc tcttgtgccg			2280
aggetgtcgg gctgtctcta ggggtggagc agctaatacag atcgcccagc ctttggccct			2340
cagaaaaagt gctgaaacgt gcccttgca cggacgtcac agccctgcga gcatctgctg			2400
gactcagggc tgetctttgc tggttcctgg gaggettgge cacatccctc atggcccat			2460
tttatccccg aaatcctggg tgtgtcacca gtgtagaggg tggggaaggg gtgtctcacc			2520
tgagctgact ttgttcttcc ttcacaacct tctgagcctt ctttgggatt ctggaaggaa			2580
ctcggcgtga gaaacatgtg acttccccct tcccttccca ctgctgctt cccacaggg			2640
gacaggctgg gctggagaaa cagaaatcct caccctgcgt cttcccaagt tagcaggtgt			2700
ctctggtgtt cagtggagg gacatgtgag tcctggcaga agccatggcc catgtctgca			2760
catccaggga ggaggacaga aggccagct cacatgtgag tcctggcaga agccatggcc			2820
catgtctgca catccaggga ggaggacaga aggccagct cacatgtgag tcctggcaga			2880
agccatggcc catgtctgca catccaggga ggaggacaga aggccagct cacatgtgag			2940
tcctggcaga agccatggcc catgtctgca catccaggga ggaggacaga aggccagct			3000
cacatgtgag tcctggcaga agccatggcc catgtctgca catccaggga ggaggacaga			3060
aggccagct cagtggcccc cgccccccac cccccacgcc cgaacagcag gggcagagca			3120
gcccctcttc gaagtgtgtc caagtccgca tttgagcctt gttctggggc ccagcccaac			3180
acctggcttg ggctcactgt cctgagttgc agtaaagcta taaccttgaa tcac			3234

&lt;210&gt; 142

&lt;211&gt; 2490

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (70)...(1026)

214/233

&lt;400&gt; 142

```

agaaagagaa gccatagtcg gcgagcaacg ctggagcatt ccgctctggt gccgctgcag      60
ccggcagag atg gtt gag ctc atg ttc ccg ctg ttg ctc ctc ctt ctg ccc      111
      Met Val Glu Leu Met Phe Pro Leu Leu Leu Leu Leu Leu Pro
          1             5             10
ttc ctt ctg tat atg gct gcg ccc caa atc agg aaa atg ctg tcc agt      159
Phe Leu Leu Tyr Met Ala Ala Pro Gln Ile Arg Lys Met Leu Ser Ser
      15             20             25             30
ggg gtg tgt aca tca act gtt cag ctt cct ggg aaa gta gtt gtg gtc      207
Gly Val Cys Thr Ser Thr Val Gln Leu Pro Gly Lys Val Val Val Val
          35             40             45
aca gga gct aat aca ggt atc ggg aag gag aca gcc aaa gag ctg gct      255
Thr Gly Ala Asn Thr Gly Ile Gly Lys Glu Thr Ala Lys Glu Leu Ala
          50             55             60
cag aga gga gct cga gta tat tta gct tgc cgg gat gtg gaa aag ggg      303
Gln Arg Gly Ala Arg Val Tyr Leu Ala Cys Arg Asp Val Glu Lys Gly
          65             70             75
gaa ttg gtg gcc aaa gag atc cag acc acg aca ggg aac cag cag gtg      351
Glu Leu Val Ala Lys Glu Ile Gln Thr Thr Thr Gly Asn Gln Gln Val
          80             85             90
ttg gtg cgg aaa ctg gac ctg tct gat act aag tct att cga gct ttt      399
Leu Val Arg Lys Leu Asp Leu Ser Asp Thr Lys Ser Ile Arg Ala Phe
          95             100             105             110
gct aag ggc ttc tta gct gag gaa aag cac ctc cac gtt ttg atc aac      447
Ala Lys Gly Phe Leu Ala Glu Glu Lys His Leu His Val Leu Ile Asn
          115             120             125
aat gca gga gtg atg atg tgt ccg tac tcg aag aca gca gat ggc ttt      495
Asn Ala Gly Val Met Met Cys Pro Tyr Ser Lys Thr Ala Asp Gly Phe
          130             135             140
gag atg cac ata gga gtc aac cac ttg ggt cac ttc ctc cta acc cat      543
Glu Met His Ile Gly Val Asn His Leu Gly His Phe Leu Leu Thr His
          145             150             155
ctg ctg cta gag aaa cta aag gaa tca gcc cca tca agg ata gta aat      591
Leu Leu Leu Glu Lys Leu Lys Glu Ser Ala Pro Ser Arg Ile Val Asn
          160             165             170

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gtg tct tcc ctc gca cat cac ctg gga agg atc cac ttc cat aac ctg	639
Val Ser Ser Leu Ala His His Leu Gly Arg Ile His Phe His Asn Leu	
175 180 185 190	
cag ggc gag aaa ttc tac aat gca ggc ctg gcc tac tgt cac agc aag	687
Gln Gly Glu Lys Phe Tyr Asn Ala Gly Leu Ala Tyr Cys His Ser Lys	
195 200 205	
cta gcc aac atc ctc ttc acc cag gaa ctg gcc cgg aga cta aaa ggc	735
Leu Ala Asn Ile Leu Phe Thr Gln Glu Leu Ala Arg Arg Leu Lys Gly	
210 215 220	
tct ggc gtt acg acg tat tct gta cac cct ggc aca gtc caa tct gaa	783
Ser Gly Val Thr Thr Tyr Ser Val His Pro Gly Thr Val Gln Ser Glu	
225 230 235	
ctg gtt cgg cac tca tct ttc atg aga tgg atg tgg tgg ctt ttc tcc	831
Leu Val Arg His Ser Ser Phe Met Arg Trp Met Trp Trp Leu Phe Ser	
240 245 250	
ttt ttc atc aag act cct cag cag gga gcc cag acc agc ctg cac tgt	879
Phe Phe Ile Lys Thr Pro Gln Gln Gly Ala Gln Thr Ser Leu His Cys	
255 260 265 270	
gcc tta aca gaa ggt ctt gag att cta agt ggg aat cat ttc agt gac	927
Ala Leu Thr Glu Gly Leu Glu Ile Leu Ser Gly Asn His Phe Ser Asp	
275 280 285	
tgt cat gtg gca tgg gtc tct gcc caa gct cgt aat gag act ata gca	975
Cys His Val Ala Trp Val Ser Ala Gln Ala Arg Asn Glu Thr Ile Ala	
290 295 300	
agg cgg ctg tgg gac gtc agt tgt gac ctg ctg ggc ctc cca ata gac	1023
Arg Arg Leu Trp Asp Val Ser Cys Asp Leu Leu Gly Leu Pro Ile Asp	
305 310 315	
taacagg cagtgccagt tggacccaag agaagactgc agcagactac acagtacttc	1080
ttgtcaaaat gattctcctt caagggttttc aaaaccttta gcacaaagag agcaaaacct	1140
tccagccttg cctgcttggt gtccagttaa aactcagtgt actgccagat tcgtctaaat	1200
gtotgtcatg tccagattta ctttgcttct gttactgcc a gattactag agatatcata	1260
ataggataag aagacctca tatgacctgc acagctcatt ttccttctga aagaaactac	1320
tacctaggag aatctaagct atagcaggg a tgatttatgc aaatttgaac tagcttcttt	1380
gttcacaatt cagttcctcc caaccaacca gtcttcaact caagaggggc acactgcaac	1440
ctcagcttaa catgaataac aaagactggc tcaggagcag ggcctgccca ggcattggtg	1500

216/233

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atcaccggag gtcagtagtt caagaccagc ctggccaaca tggtgaaacc ccacctotac 1560
taaaaattgt gtatatcttt gtgtgtcttc ctgtttatgt gtgccaaggg agtatcttca 1620
caaagttcaa aacagccaca ataatcagag atggagcaaa ccagtgccat ccagtcttta 1680
tgcaaatgaa atgctgcaaa ggggaagcaga ttctgtatat gttggtaact acccaccaag 1740
agcacatggg tagcaggga gaagtaaaaa aagagaagga gaatactgga agataatgca 1800
caaaatgaag ggactagtta aggattaact agccctttaa ggattaacta gttaaggatt 1860
aatagcaaaa gatattaaat atgctaacat agctatggag gaattgaggg caagcaccca 1920
ggactgatga ggtcttaaca aaaaccagtg tggcaaaaaa aaaaaaaaaa aaaaaaaaaa 1980
aaaaaaaaatcc taaaaacaaa caaacaaaaa aaacaattct tcattcagaa aaattatctt 2040
agggactgat attggttaatt atggccaatt taataatatt ttggggcatt tccttacatt 2100
gtcttgacaa gattaaaatg tctgtgcaa aattttgtat tttatttggg gacttcttat 2160
caaaaagtaat gctgccaaag gaagtctaag gaattagtag tgttcccatc acttgtttgg 2220
agtgtgctat tctaaaagat tttgatttcc tggaatgaca attataatatt aactttgggtg 2280
ggggaaagag ttataggacc acagtcttca cttotgatac ttgtaaatta atcttttatt 2340
gcacttgttt tgaccattaa gctatatgtt tagaaatggg cattttacgg aaaaattaga 2400
aaaattctga taatagtga gaataaatga attaatgttt tacttaattt atattgaact 2460
gtcaatgaca aataaaaatt ctttttgatt 2490

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&lt;210&gt; 143

&lt;211&gt; 1465

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (84)...(332)

&lt;400&gt; 143

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gaaggcgccg gccgtggagg cgccacgtcc cttgcggcgg cgggagagaa atcgcttggg 60
cttcggggcg gccctggacg gcc atg gcc ttt acc ctg tac tca ctg ctg 110
Met Ala Phe Thr Leu Tyr Ser Leu Leu
1 5
cag gca gcc ctg ctc tgc gtc aac gcc atc gca gtg ctg cac gag gag 158
Gln Ala Ala Leu Leu Cys Val Asn Ala Ile Ala Val Leu His Glu Glu
10 15 20 25
cga ttc ctc aag aac att ggc tgg gga aca gac cag gga att ggt gga 206
Arg Phe Leu Lys Asn Ile Gly Trp Gly Thr Asp Gln Gly Ile Gly Gly

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217/233

30	35	40	
ttt gga gaa gag ccg gga att aaa tca cag cta atg aac ctt att cga			254
Phe Gly Glu Glu Pro Gly Ile Lys Ser Gln Leu Met Asn Leu Ile Arg			
45	50	55	
tct gta aga acc gtg atg aga gtg cca ttg ata ata gta aac tca att			302
Ser Val Arg Thr Val Met Arg Val Pro Leu Ile Ile Val Asn Ser Ile			
60	65	70	
gca att gtg tta ctt tta tta ttt gga tgaatatcag tggagaaaat g			350
Ala Ile Val Leu Leu Leu Leu Phe Gly			
75	80		
gagactcaga agaggacatg ccagtagaag ttattacttt ggtcattatt ggaatattta			410
tatotttagct ggctgacott gcacttgta aaaatgtaaa gctgaaaata aaaccaggg			470
ttctatttat ctgttttttt ttttaattgt gcacttgtag ttccattaca aaagatcaga			530
tcataaaagg cagtaactct ccaggactgg aatatctgat tgctcagtgt taatagtagt			590
tcatactgtg gtgagattgt taaaaggggt caagactgtt gcttctcttt ttttagatat			650
ttttctatct ctcaactctc agggatgaaa ttctttttca aagttttgaa gttccttgca			710
acttagccat gatgtgagt gttatcccta gataaaatta aaaggatttt taaaaagtaa			770
ttactgcaca taaaatgata aataggtaat ttgaataatt ttattttaag ctcttggtt			830
aattattttg tctattgtct cagctataaa ttcaaattta tacatactat tgagtattaa			890
tattctctga ttccaggag aattctgtca gtcacatgat gattatgttt ttgtttaaca			950
ttctttccat gcacttgta ttttattaat ttgcctgaat gatgagacca gaccagtgtc			1010
tacagatttt cattgtcaga aaaatctata agtctgccct ttttacaatg atgatttaaa			1070
aaaaacaaca gcgtaaatat tagcccacaa gagcagtcct aaacaatcac aattacactg			1130
tactacccaa gaagactgtt tattgtgaag catttacott tcaaaaaatc attacatttc			1190
tatttcttgg tggagcagca cattgtggag tgtgattott aattcttcat tgagtttgtc			1250
aataggacat tgatgtgga taggttgtct tttgttttta tgtctcagac catcttgtga			1310
gattgtttgc ctatctcata atacagtttt atgcagaaag gttgaaacta tgtaaatggt			1370
ttttatggaa attatcagtt acaatatttt aaagggttag aatggcatct ttgtttatag			1430
gagaacattt gtaaataaag ttaaatttct aagtc			1465

&lt;210&gt; 144

&lt;211&gt; 917

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

218/233

&lt;221&gt; CDS

&lt;222&gt; (32)...(775)

&lt;400&gt; 144

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tctctgcatc cttcccgacc ttcccagcaa t atg cat ctt gca cgt ctg gtc      52
                                Met His Leu Ala Arg Leu Val
                                1           5

ggc tcc tgc tcc ctc ctt ctg cta ctg ggg gcc ctg tct gga tgg gcg      100
Gly Ser Cys Ser Leu Leu Leu Leu Leu Gly Ala Leu Ser Gly Trp Ala
      10           15           20

gcc agc gat gac ccc att gag aag gtc att gaa ggg atc aac cga ggg      148
Ala Ser Asp Asp Pro Ile Glu Lys Val Ile Glu Gly Ile Asn Arg Gly
      25           30           35

ctg agc aat gca gag aga gag gtg ggc aag gcc ctg gat ggc atc aac      196
Leu Ser Asn Ala Glu Arg Glu Val Gly Lys Ala Leu Asp Gly Ile Asn
      40           45           50           55

agt gga atc acg cat gcc gga agg gaa gtg gag aag gtt ttc aac gga      244
Ser Gly Ile Thr His Ala Gly Arg Glu Val Glu Lys Val Phe Asn Gly
      60           65           70

ctt agc aac atg ggg agc cac acc ggc aag gag ttg gac aaa ggc gtc      292
Leu Ser Asn Met Gly Ser His Thr Gly Lys Glu Leu Asp Lys Gly Val
      75           80           85

cag ggg ctc aac cac ggc atg gac aag gtt gcc cat gag atc aac cat      340
Gln Gly Leu Asn His Gly Met Asp Lys Val Ala His Glu Ile Asn His
      90           95           100

ggt att gga caa gca gga aag gaa gca gag aag ctt ggc cat ggg gtc      388
Gly Ile Gly Gln Ala Gly Lys Glu Ala Glu Lys Leu Gly His Gly Val
      105           110           115

aac aac gct gct gga cag gcc ggg aag gaa gca gac aaa gcg gtc caa      436
Asn Asn Ala Ala Gly Gln Ala Gly Lys Glu Ala Asp Lys Ala Val Gln
      120           125           130           135

ggg ttc cac act ggg gtc cac cag gct ggg aag gaa gca gag aaa ctt      484
Gly Phe His Thr Gly Val His Gln Ala Gly Lys Glu Ala Glu Lys Leu
      140           145           150

ggc caa ggg gtc aac cat gct gct gac cag gct gga aag gaa gtg gag      532
Gly Gln Gly Val Asn His Ala Ala Asp Gln Ala Gly Lys Glu Val Glu

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219/233

155	160	165	
aag ctt ggc caa ggt gcc cac cat gct gct ggc cag gcc ggg aag gag			580
Lys Leu Gly Gln Gly Ala His His Ala Ala Gly Gln Ala Gly Lys Glu			
170	175	180	
ctg cag aat gct cat aat ggg gtc aac caa gcc agc aag gag gcc aac			628
Leu Gln Asn Ala His Asn Gly Val Asn Gln Ala Ser Lys Glu Ala Asn			
185	190	195	
cag ctg ctg aat ggc aac cat caa agc gga tct tcc agc cat caa gga			676
Gln Leu Leu Asn Gly Asn His Gln Ser Gly Ser Ser Ser His Gln Gly			
200	205	210	215
ggg gcc aca acc acg ccg tta gcc tct ggg gcc tcg gtc aac acg cct			724
Gly Ala Thr Thr Thr Pro Leu Ala Ser Gly Ala Ser Val Asn Thr Pro			
220	225	230	
ttc atc aac ctt ccc gcc ctg tgg agg agc gtc gcc aac atc atg ccc			772
Phe Ile Asn Leu Pro Ala Leu Trp Arg Ser Val Ala Asn Ile Met Pro			
235	240	245	
taaaactgg catccggcct tgcaggagaga ataatgtcgc cgttgtcaca tcagctgaca			830
tgacctggag ggggtggggg tgggggacag gtttctgaaa tccctgaagg ggggtgtact			890
gggatttgtg aataaacttg atacact			917

&lt;210&gt; 145

&lt;211&gt; 1306

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (74)...(694)

&lt;400&gt; 145

gaaggaccaa aggcgaccgg tgcagggtgca cgacgccagc tcccttctgg ggggcggggg	60
cctggggggtt gcc atg gcc ccc agc cac ctg toa gtg cgg gag atg agg	109
Met Ala Pro Ser His Leu Ser Val Arg Glu Met Arg	
1 5 10	
gaa gat gag aag ccc ctg gtg ctg gag atg ctg aag gcc ggc gtg aag	157
Glu Asp Glu Lys Pro Leu Val Leu Glu Met Leu Lys Ala Gly Val Lys	
15 20 25	



220/233

gac acg gaa aac cgc gtg gcc ctc cat gcc ttg aca cgg ccg ccg gcc	205
Asp Thr Glu Asn Arg Val Ala Leu His Ala Leu Thr Arg Pro Pro Ala	
30 35 40	
ctg ctc ctc ctg gcg gcg gcc agc agc ggc ctg cgc ttt gtc ctg gct	253
Leu Leu Leu Leu Ala Ala Ala Ser Ser Gly Leu Arg Phe Val Leu Ala	
45 50 55 60	
tcc ttc gcc ctg gcc ctc ctc ctg ccg gtg ttc ctg gct gtg gcc gcc	301
Ser Phe Ala Leu Ala Leu Leu Leu Pro Val Phe Leu Ala Val Ala Ala	
65 70 75	
gtg aag ctg ggc ctg cgg gcc cga tgg ggc tcg ctg cct ccg ccg ggt	349
Val Lys Leu Gly Leu Arg Ala Arg Trp Gly Ser Leu Pro Pro Pro Gly	
80 85 90	
ggc ctg ggg ggc ccc tgg gtg gcc gtg cgg ggc tcc ggt gac gtg tgt	397
Gly Leu Gly Gly Pro Trp Val Ala Val Arg Gly Ser Gly Asp Val Cys	
95 100 105	
ggg gtc ctg gct ctg gcc cct ggc aca aat gca ggg gac ggg gcc cgg	445
Gly Val Leu Ala Leu Ala Pro Gly Thr Asn Ala Gly Asp Gly Ala Arg	
110 115 120	
gtc acc cgc ctg tot gtc tot cgc tgg cac cgc cgc cgg ggc gtg gcc	493
Val Thr Arg Leu Ser Val Ser Arg Trp His Arg Arg Arg Gly Val Gly	
125 130 135 140	
agg agg ctg ctg gcc ttc gcg gag gcc cgg gct cgg gcc tgg gct ggg	541
Arg Arg Leu Leu Ala Phe Ala Glu Ala Arg Ala Arg Ala Trp Ala Gly	
145 150 155	
ggc atg ggg gag ccc cgg gcc cgg ctc gtg gtc ccc gtg gct gtg gcc	589
Gly Met Gly Glu Pro Arg Ala Arg Leu Val Val Pro Val Ala Val Ala	
160 165 170	
gcc tgg ggg gtg gga ggg atg ctg gag ggc tgt gcc tac cag gcc gag	637
Ala Trp Gly Val Gly Gly Met Leu Glu Gly Cys Gly Tyr Gln Ala Glu	
175 180 185	
ggg ggc tgg ggc tgc ctg ggc tac acg ctg gtg agg gaa ttc agc aaa	685
Gly Gly Trp Gly Cys Leu Gly Tyr Thr Leu Val Arg Glu Phe Ser Lys	
190 195 200	
gac ctg tgaagctaca gactgacagc cagggcaggg gaggagggag gggcgccag	740
Asp Leu	

221/233

205

cacctgatga tgcctactg tctgcgggtt cttttacctg ctctccctca gtgagtcctc	800
aaccacctg gggccagaaa cagaggcctg ccgaggggag gagcctggcc tctgtccacc	860
cgtcagcagt gtgaagtctg ttgtgtttga gcttctcaga gtggaatgac tccttttctt	920
tcctggccct cgggggcctc tcgaggtcag cctctccaac ccctacctca gctcctgtct	980
gcactgagaa acctccccgg gtgatgtctg caaagtctgt gctgtccgtg ccccaggctg	1040
ggagagctat ctggggaggg ggagaggagg ccgagcagaa tacaccccag agttagggtt	1100
tgcgactccg cctccctggg acctggattg ggtcagatgc ctgtccttgg aggggacaag	1160
gttgactgct taggaggcgc gacgcacagg gctgccaggc ctggcccctc tctgggaagg	1220
ttgagagctg agacgggcag cctgtccct tcctccagat ccgtctggtt ttttacaccg	1280
tttgtaata aagcctgaaa ccgctt	1306

&lt;210&gt; 146

&lt;211&gt; 2022

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (118)...(1416)

&lt;400&gt; 146

cttcgctgg ccgctggctc gctggccgct cctggaggcg gcggcgggag cgcagggggc	60
gcggggcccg gggactcgca ttccccggtt cccctccac cccacgcggc ctggacc	117
atg gac gcc aga tgg tgg gca gtg gtg gtg ctg gct gcg ttc ccc tcc	165
Met Asp Ala Arg Trp Trp Ala Val Val Val Leu Ala Ala Phe Pro Ser	
1 5 10 15	
cta ggg gca ggt ggg gag act ccc gaa gcc cct ccg gag tca tgg acc	213
Leu Gly Ala Gly Gly Glu Thr Pro Glu Ala Pro Pro Glu Ser Trp Thr	
20 25 30	
cag cta tgg ttc ttc cga ttt gtg gtg aat gct gct ggc tat gcc agc	261
Gln Leu Trp Phe Phe Arg Phe Val Val Asn Ala Ala Gly Tyr Ala Ser	
35 40 45	
ttt atg gta cct ggc tac ctc ctg gtg cag tac ttc agg cgg aag aac	309
Phe Met Val Pro Gly Tyr Leu Leu Val Gln Tyr Phe Arg Arg Lys Asn	
50 55 60	
tac ctg gag acc ggt agg ggc ctc tgc ttt ccc ctg gtg aaa gct tgt	357

222/233

Tyr	Leu	Glu	Thr	Gly	Arg	Gly	Leu	Cys	Phe	Pro	Leu	Val	Lys	Ala	Cys		
65					70					75					80		
gtg	ttt	ggc	aat	gag	ccc	aag	gcc	tct	gat	gag	gtt	ccc	ctg	gcg	ccc	405	
Val	Phe	Gly	Asn	Glu	Pro	Lys	Ala	Ser	Asp	Glu	Val	Pro	Leu	Ala	Pro		
				85						90					95		
cga	aca	gag	gcg	gca	gag	acc	acc	ccg	atg	tgg	cag	gcc	ctg	aag	ctg	453	
Arg	Thr	Glu	Ala	Ala	Glu	Thr	Thr	Pro	Met	Trp	Gln	Ala	Leu	Lys	Leu		
				100						105					110		
ctc	ttc	tgt	gcc	aca	ggg	ctc	cag	gtg	tct	tat	ctg	act	tgg	ggt	gtg	501	
Leu	Phe	Cys	Ala	Thr	Gly	Leu	Gln	Val	Ser	Tyr	Leu	Thr	Trp	Gly	Val		
				115						120					125		
ctg	cag	gaa	aga	gtg	atg	acc	cgc	agc	tat	ggg	gcc	aca	gcc	aca	tca	549	
Leu	Gln	Glu	Arg	Val	Met	Thr	Arg	Ser	Tyr	Gly	Ala	Thr	Ala	Thr	Ser		
				130						135					140		
ccg	ggt	gag	cgc	ttt	acg	gac	tcg	cag	ttc	ctg	gtg	cta	atg	aac	cga	597	
Pro	Gly	Glu	Arg	Phe	Thr	Asp	Ser	Gln	Phe	Leu	Val	Leu	Met	Asn	Arg		
145					150					155					160		
gtg	ctg	gca	ctg	att	gtg	gct	ggc	ctc	tcc	tgt	gtt	ctc	tgc	aag	cag	645	
Val	Leu	Ala	Leu	Ile	Val	Ala	Gly	Leu	Ser	Cys	Val	Leu	Cys	Lys	Gln		
					165					170					175		
ccc	cgg	cat	ggg	gca	ccc	atg	tac	cgg	tac	tcc	ttt	gcc	agc	ctg	tcc	693	
Pro	Arg	His	Gly	Ala	Pro	Met	Tyr	Arg	Tyr	Ser	Phe	Ala	Ser	Leu	Ser		
					180					185					190		
aat	gtg	ctt	agc	agc	tgg	tgc	caa	tac	gaa	gct	ctt	aag	ttc	gtc	agc	741	
Asn	Val	Leu	Ser	Ser	Trp	Cys	Gln	Tyr	Glu	Ala	Leu	Lys	Phe	Val	Ser		
					195					200					205		
ttc	ccc	acc	cag	gtg	ctg	gcc	aag	gcc	tct	aag	gtg	atc	cct	gtc	atg	789	
Phe	Pro	Thr	Gln	Val	Leu	Ala	Lys	Ala	Ser	Lys	Val	Ile	Pro	Val	Met		
					210					215					220		
ctg	atg	gga	aag	ctt	gtg	tct	cgg	cgc	agc	tac	gaa	cac	tgg	gag	tac	837	
Leu	Met	Gly	Lys	Leu	Val	Ser	Arg	Arg	Ser	Tyr	Glu	His	Trp	Glu	Tyr		
225						230					235				240		
ctg	aca	gcc	aca	ctc	atc	tcc	att	ggg	gtc	agc	atg	ttt	ctg	cta	tcc	885	
Leu	Thr	Ala	Thr	Leu	Ile	Ser	Ile	Gly	Val	Ser	Met	Phe	Leu	Leu	Ser		
					245					250					255		

223/233

agc gga cca gag ccc cgc agc tcc cca gcc acc aca ctc tca ggc ctc	933
Ser Gly Pro Glu Pro Arg Ser Ser Pro Ala Thr Thr Leu Ser Gly Leu	
260 265 270	
atc tta ctg gca ggt tat att gct ttt gac agc ttc acc tca aac tgg	981
Ile Leu Leu Ala Gly Tyr Ile Ala Phe Asp Ser Phe Thr Ser Asn Trp	
275 280 285	
cag gat gcc ctg ttt gcc tat aag atg tca tcg gtg cag atg atg ttt	1029
Gln Asp Ala Leu Phe Ala Tyr Lys Met Ser Ser Val Gln Met Met Phe	
290 295 300	
ggg gtc aat ttc ttc tcc tgc ctc ttc aca gtg ggc tca ctg cta gaa	1077
Gly Val Asn Phe Phe Ser Cys Leu Phe Thr Val Gly Ser Leu Leu Glu	
305 310 315 320	
cag ggg gcc cta ctg gag gga acc cgc ttc atg ggg cga cac agt gag	1125
Gln Gly Ala Leu Leu Glu Gly Thr Arg Phe Met Gly Arg His Ser Glu	
325 330 335	
ttt gct gcc cat gcc ctg cta ctc tcc atc tgc tcc gca tgt ggc cag	1173
Phe Ala Ala His Ala Leu Leu Leu Ser Ile Cys Ser Ala Cys Gly Gln	
340 345 350	
ctc ttc atc ttt tac acc att ggg cag ttt ggg gct gcc gtc ttc acc	1221
Leu Phe Ile Phe Tyr Thr Ile Gly Gln Phe Gly Ala Ala Val Phe Thr	
355 360 365	
atc atc atg acc ctc cgc cag gcc ttt gcc atc ctt ctt tcc tgc ctt	1269
Ile Ile Met Thr Leu Arg Gln Ala Phe Ala Ile Leu Leu Ser Cys Leu	
370 375 380	
ctc tat ggc cac act gtc act gtg gtg gga ggg ctg ggg gtg gct gtg	1317
Leu Tyr Gly His Thr Val Thr Val Val Gly Gly Leu Gly Val Ala Val	
385 390 395 400	
gtc ttt gct gcc ctc ctg ctc aga gtc tac gcg cgg ggc cgt cta aag	1365
Val Phe Ala Ala Leu Leu Leu Arg Val Tyr Ala Arg Gly Arg Leu Lys	
405 410 415	
caa cgg gga aag aag gct gtg cct gtt gag tct cct gtg cag aag gtt	1413
Gln Arg Gly Lys Lys Ala Val Pro Val Glu Ser Pro Val Gln Lys Val	
420 425 430	
tgaggggt ggaaagggcc tgaggggtga agtgaaatag gaccctccca ccacccctt	1470
ctgctgtaac ctctgagggga gctggctgaa agggcaaat gcaggtgttt totcagtatc	1530

224/233

acagaccagc tctgcagcag gggattggg agcccaggag gcagccttcc cttttgcctt 1590  
 aagtcaccca tcttccagta agcagtttat tctgagcccc gggggtagac agtcctcagt 1650  
 gaggggtttt ggggagtttg gggcaagag agcataggta ggttccacag ttactcttcc 1710  
 cacaagttcc cttaagtctt gccctagctg tgccttgcca ccttccagac tcactccct 1770  
 ctgcaaatac ctgcatttct taccctgggt agaaaagcac aagcgggtga ggtccaatg 1830  
 ctgctttccc aggaggtga agatgggtgct gtctgagga aaggggatgc agagccctgc 1890  
 ccagcaccac cacctcctat gtcctggat ccctaggctc tgttccatga gcctgttgca 1950  
 ggttttggtta ctttagaaat gtaacttttt gctottataa ttttatttta ttaaattaaa 2010  
 ttactgcagt gg 2022

&lt;210&gt; 147

&lt;211&gt; 1227

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (75)...(995)

&lt;400&gt; 147

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 Met Gly His Arg Thr Leu Val Leu Pro Trp Val Leu  
 1 5 10  
 ctg acc ttg tgt gtc act gcg ggg acc ccg gag gtg tgg gtt caa gtt 158  
 Leu Thr Leu Cys Val Thr Ala Gly Thr Pro Glu Val Trp Val Gln Val  
 15 20 25  
 cgg atg gag gcc acc gag ctc tcg tcc ttc acc atc cgt tgt ggg ttc 206  
 Arg Met Glu Ala Thr Glu Leu Ser Ser Phe Thr Ile Arg Cys Gly Phe  
 30 35 40  
 ctg ggg tct ggc tcc atc tcc ctg gtg act gtg agc tgg ggg ggc ccc 254  
 Leu Gly Ser Gly Ser Ile Ser Leu Val Thr Val Ser Trp Gly Gly Pro  
 45 50 55 60  
 gac ggt gct ggg ggg acc acg ctg gct gtg ttg cac cca gaa cgt ggc 302  
 Asp Gly Ala Gly Gly Thr Thr Leu Ala Val Leu His Pro Glu Arg Gly  
 65 70 75  
 atc cgg caa tgg gcc cct gct cgc cag gcc cgc tgg gaa acc cag agc 350

225/233

Ile Arg Gln Trp Ala Pro Ala Arg Gln Ala Arg Trp Glu Thr Gln Ser	
80 85 90	
agc atc tct ctc atc ctg gaa ggc tct ggg gcc agc agc ccc tgc gcc	398
Ser Ile Ser Leu Ile Leu Glu Gly Ser Gly Ala Ser Ser Pro Cys Ala	
95 100 105	
aac acc acc ttc tgc tgc aag ttt gcg tcc ttc cct gag ggc tcc tgg	446
Asn Thr Thr Phe Cys Cys Lys Phe Ala Ser Phe Pro Glu Gly Ser Trp	
110 115 120	
gag gcc tgt ggg agc ctc ccg ccc agc tca gac cca ggg ctc tct gcc	494
Glu Ala Cys Gly Ser Leu Pro Pro Ser Ser Asp Pro Gly Leu Ser Ala	
125 130 135 140	
ccg ccg act cct gcc ccc att ctg cgg gca gac ctg gcc ggg atc ttg	542
Pro Pro Thr Pro Ala Pro Ile Leu Arg Ala Asp Leu Ala Gly Ile Leu	
145 150 155	
ggg gtc tca gga gtc ctc ctc ttt ggc tgt gtc tac ctc ctt cat ctg	590
Gly Val Ser Gly Val Leu Leu Phe Gly Cys Val Tyr Leu Leu His Leu	
160 165 170	
ctg cgc cga cat aag cac cgc cct gcc cct agg ctc cag ccg tcc cgc	638
Leu Arg Arg His Lys His Arg Pro Ala Pro Arg Leu Gln Pro Ser Arg	
175 180 185	
acc agc ccc cag gca ccg aga gca cga gca tgg gca cca agc cag gcc	686
Thr Ser Pro Gln Ala Pro Arg Ala Arg Ala Trp Ala Pro Ser Gln Ala	
190 195 200	
tcc cag gct gct ctt cac gtc cct tat gcc act atc aac acc agc tgc	734
Ser Gln Ala Ala Leu His Val Pro Tyr Ala Thr Ile Asn Thr Ser Cys	
205 210 215 220	
cgc cca gct act ttg gac aca gct cac ccc cat ggg ggg ccg tcc tgg	782
Arg Pro Ala Thr Leu Asp Thr Ala His Pro His Gly Gly Pro Ser Trp	
225 230 235	
tgg gcg tca ctc ccc acc cac gct gca cac cgg ccc cag ggc cct gcc	830
Trp Ala Ser Leu Pro Thr His Ala Ala His Arg Pro Gln Gly Pro Ala	
240 245 250	
gcc tgg gcc tcc aca ccc atc cct gca cgt ggc agc ttt gtc tct gtt	878
Ala Trp Ala Ser Thr Pro Ile Pro Ala Arg Gly Ser Phe Val Ser Val	
255 260 265	

226/233

gag aat gga ctc tac gct cag gca ggg gag agg cct cct cac act ggt 926  
 Glu Asn Gly Leu Tyr Ala Gln Ala Gly Glu Arg Pro Pro His Thr Gly  
 270 275 280  
 ccc gcc ctc act ctt ttc cct gac cct cgg ggg ccc agg gcc atg gaa 974  
 Pro Gly Leu Thr Leu Phe Pro Asp Pro Arg Gly Pro Arg Ala Met Glu  
 285 290 295 300  
 gga ccc tta gga gtt cga tgagagagac catgaggcca ctgggctt 1020  
 Gly Pro Leu Gly Val Arg  
 305  
 tccccctccc aggcctcctg ggtgtcaccc ccttacttta attcttgggc ctccaataag 1080  
 tgtcccatag gtgtctggcc aggccacact gctgcggatg tggctctgtgt gcgtgtgtgg 1140  
 gcacaggtgt gagtgtgtga gtgacagtta cccatttca gtcatttcct gctgcaacta 1200  
 agtcagcaac acagtttctc tgatgtc 1227  
  
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 ggccgagacc ggagcgccgc tcgccgcaga cttacttccc cggctcagca gggaaagggt 180  
 cctagaagggt gagecgaggac ggt atg caa agt tgt gaa tcc agt ggt gac agt 233  
 Met Gln Ser Cys Glu Ser Ser Gly Asp Ser  
 1 5 10  
 gcg gat gac cct ctc agt cgc gcc cta cgg aga agg gga cag cct cgt 281  
 Ala Asp Asp Pro Leu Ser Arg Gly Leu Arg Arg Arg Gly Gln Pro Arg  
 15 20 25  
 gtg gtg gtg atc gcc gcc gcc ttg gct gcc ctg gct gca gcc aaa gca 329  
 Val Val Val Ile Gly Ala Gly Leu Ala Gly Leu Ala Ala Lys Ala  
 30 35 40  
 ctt ctt gag cag ggt ttc acg gat gtc act gtg ctt gag gct tcc agc 377

227/233

Leu Leu Glu Gln Gly Phe Thr Asp Val Thr Val Leu Glu Ala Ser Ser	
45 50 55	
cac atc gga ggc cgt gtg cag agt gtg aaa ctt gga cac gcc acc ttt	425
His Ile Gly Gly Arg Val Gln Ser Val Lys Leu Gly His Ala Thr Phe	
60 65 70	
gag ctg gga gcc acc tgg atc cat ggc tcc cat ggg aac cct atc tat	473
Glu Leu Gly Ala Thr Trp Ile His Gly Ser His Gly Asn Pro Ile Tyr	
75 80 85 90	
cat cta gca gaa gcc aac ggc ctc ctg gaa gag aca acc gat ggg gaa	521
His Leu Ala Glu Ala Asn Gly Leu Leu Glu Glu Thr Thr Asp Gly Glu	
95 100 105	
cgc agc gtg ggc cgc atc agc ctc tat tcc aag aat ggc gtg gcc tgc	569
Arg Ser Val Gly Arg Ile Ser Leu Tyr Ser Lys Asn Gly Val Ala Cys	
110 115 120	
tac ctt acc aac cac ggc cgc agg atc ccc aag gac gtg gtt gag gaa	617
Tyr Leu Thr Asn His Gly Arg Arg Ile Pro Lys Asp Val Val Glu Glu	
125 130 135	
ttc agc gat tta tac aac gag gtc tat aac ttg acc cag gag ttc ttc	665
Phe Ser Asp Leu Tyr Asn Glu Val Tyr Asn Leu Thr Gln Glu Phe Phe	
140 145 150	
cgg cac gat aaa cca gtc aat gct gaa agt caa aat agc gtg ggg gtg	713
Arg His Asp Lys Pro Val Asn Ala Glu Ser Gln Asn Ser Val Gly Val	
155 160 165 170	
ttc acc cga gag gag gtg cgt aac cgc atc agg aat gac cct gac gac	761
Phe Thr Arg Glu Glu Val Arg Asn Arg Ile Arg Asn Asp Pro Asp Asp	
175 180 185	
cca gag gct acc aag cgc ctg aag ctc gcc atg atc cag cag tac ctg	809
Pro Glu Ala Thr Lys Arg Leu Lys Leu Ala Met Ile Gln Gln Tyr Leu	
190 195 200	
aag gtg gag agc tgt gag agc agc tca cac agc atg gac gag gtg tcc	857
Lys Val Glu Ser Cys Glu Ser Ser Ser His Ser Met Asp Glu Val Ser	
205 210 215	
ctg agc gcc ttc ggg gag tgg acc gag atc ccc ggc gct cac cac atc	905
Leu Ser Ala Phe Gly Glu Trp Thr Glu Ile Pro Gly Ala His His Ile	
220 225 230	



228/233

atc ccc tcg ggc ttc atg cgg gtt gtg gag ctg ctg gcg gag ggc atc	953
Ile Pro Ser Gly Phe Met Arg Val Val Glu Leu Leu Ala Glu Gly Ile	
235                      240                      245                      250	
cct gcc cac gtc atc cag cta ggg aaa cct gtc cgc tgc att cac tgg	1001
Pro Ala His Val Ile Gln Leu Gly Lys Pro Val Arg Cys Ile His Trp	
255                      260                      265	
gac cag gcc tca gcc cgc ccc aga ggc cct gag att gag ccc cgg ggt	1049
Asp Gln Ala Ser Ala Arg Pro Arg Gly Pro Glu Ile Glu Pro Arg Gly	
270                      275                      280	
gag ggc gac cac aat cac gac act ggg gag ggt ggc cag ggt gga gag	1097
Glu Gly Asp His Asn His Asp Thr Gly Glu Gly Gly Gln Gly Gly Glu	
285                      290                      295	
gag ccc cgg ggg ggc agg tgg gat gag gat gag cag tgg tcg gtg gtg	1145
Glu Pro Arg Gly Gly Arg Trp Asp Glu Asp Glu Gln Trp Ser Val Val	
300                      305                      310	
gtg gag tgc gag gac tgt gag ctg atc ccg gcg gac cat gtg att gtg	1193
Val Glu Cys Glu Asp Cys Glu Leu Ile Pro Ala Asp His Val Ile Val	
315                      320                      325                      330	
acc gtg tcg cta ggt gtg cta aag agg cag tac acc agt ttc ttc cgg	1241
Thr Val Ser Leu Gly Val Leu Lys Arg Gln Tyr Thr Ser Phe Phe Arg	
335                      340                      345	
cca ggc ctg ccc aca gag aag gtg gct gcc atc cac cgc ctg ggc att	1289
Pro Gly Leu Pro Thr Glu Lys Val Ala Ala Ile His Arg Leu Gly Ile	
350                      355                      360	
ggc acc acc gac aag atc ttt ctg gaa ttc gag gag ccc ttc tgg ggc	1337
Gly Thr Thr Asp Lys Ile Phe Leu Glu Phe Glu Glu Pro Phe Trp Gly	
365                      370                      375	
cct gag tgc aac agc cta cag ttt gtg tgg gag gac gaa gcg gag agc	1385
Pro Glu Cys Asn Ser Leu Gln Phe Val Trp Glu Asp Glu Ala Glu Ser	
380                      385                      390	
cac acc ctc acc tac cca cct gag ctc tgg tac cgc aag atc tgc ggc	1433
His Thr Leu Thr Tyr Pro Pro Glu Leu Trp Tyr Arg Lys Ile Cys Gly	
395                      400                      405                      410	
ttt gat gtc ctc tac ccg cct gag cgc tac ggc cat gtg ctg agc ggc	1481
Phe Asp Val Leu Tyr Pro Pro Glu Arg Tyr Gly His Val Leu Ser Gly	

229/233

415	420	425	
tgg atc tgc ggg gag gag gcc ctc gtc atg gag aag tgt gat gac gag			1529
Trp Ile Cys Gly Glu Glu Ala Leu Val Met Glu Lys Cys Asp Asp Glu			
430	435	440	
gca gtg gcc gag atc tgc acg gag atg ctg cgt cag ttc aca ggg aac			1577
Ala Val Ala Glu Ile Cys Thr Glu Met Leu Arg Gln Phe Thr Gly Asn			
445	450	455	
ccc aac att cca aaa cct cgg cga atc ttg cgc tcg gcc tgg ggc agc			1625
Pro Asn Ile Pro Lys Pro Arg Arg Ile Leu Arg Ser Ala Trp Gly Ser			
460	465	470	
aac cct tac ttc cgc ggc tcc tat tca tac acg cag gtg ggc tcc agc			1673
Asn Pro Tyr Phe Arg Gly Ser Tyr Ser Tyr Thr Gln Val Gly Ser Ser			
475	480	485	490
ggg gcg gat gtg gag aag ctg gcc aag ccc ctg ccg tac acg gag agc			1721
Gly Ala Asp Val Glu Lys Leu Ala Lys Pro Leu Pro Tyr Thr Glu Ser			
495	500	505	
tca aag aca gcg ccc atg cag gtg ctg ttt tcc ggt gag gcc acc cac			1769
Ser Lys Thr Ala Pro Met Gln Val Leu Phe Ser Gly Glu Ala Thr His			
510	515	520	
cgc aag tac tat tcc acc acc cac ggt gct ctg ctg tcc ggc cag cgt			1817
Arg Lys Tyr Tyr Ser Thr Thr His Gly Ala Leu Leu Ser Gly Gln Arg			
525	530	535	
gag gct gcc cgc ctc att gag atg tac cga gac ctc ttc cag cag ggg			1865
Glu Ala Ala Arg Leu Ile Glu Met Tyr Arg Asp Leu Phe Gln Gln Gly			
540	545	550	
acc tgagggtgt cctcgtgtgt gagaagagcc actaactcgt gacctccagc ct			1920
Thr			
555			
gccccttget gccgtgtget cctgccttcc tgatcctctg tagaaaggat ttttatcttc			1980
tgtagagcta gccgcctga ctgccttcag acctggccct gtagcttttc tttttctcca			2040
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ttgcctaccc tctgtcctgc cttgttattg taagtgcctt caatactttg cattttggga			2160
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230/233

&lt;211&gt; 1493

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (93)...(845)

&lt;400&gt; 149

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gcaggacatg acaccagtgg catatcacgg cc atg ggg tct cag cat tcc gct      113
                               Met Gly Ser Gln His Ser Ala
                               1             5

gct gct cgc ccc tcc tcc tgc agg cga aag caa gaa gat gac agg gac      161
Ala Ala Arg Pro Ser Ser Cys Arg Arg Lys Gln Glu Asp Asp Arg Asp
      10             15             20

ggg ttg ctg gct gaa cga gag cag gaa gaa gcc att gct cag ttc oca      209
Gly Leu Leu Ala Glu Arg Glu Gln Glu Glu Ala Ile Ala Gln Phe Pro
      25             30             35

tat gtg gaa ttc acc ggg aga gat agc atc acc tgt ctc acg tgc cag      257
Tyr Val Glu Phe Thr Gly Arg Asp Ser Ile Thr Cys Leu Thr Cys Gln
      40             45             50             55

ggg aca ggc tac att cca aca gag caa gta aat gag ttg gtg gct ttg      305
Gly Thr Gly Tyr Ile Pro Thr Glu Gln Val Asn Glu Leu Val Ala Leu
      60             65             70

atc cca cac agt gat cag aga ttg cgc cct cag cga act aag caa tat      353
Ile Pro His Ser Asp Gln Arg Leu Arg Pro Gln Arg Thr Lys Gln Tyr
      75             80             85

gtc ctc ctg tcc atc ctg ctt tgt ctc ctg gca tct ggt ttg gtg gtt      401
Val Leu Leu Ser Ile Leu Leu Cys Leu Leu Ala Ser Gly Leu Val Val
      90             95             100

ttc ttc ctg ttt ccg cat tca gtc ctt gtg gat gat gac ggc atc aaa      449
Phe Phe Leu Phe Pro His Ser Val Leu Val Asp Asp Asp Gly Ile Lys
      105             110             115

gtg gtg aaa gtc aca ttt aat aag caa gac tcc ctt gta att ctc acc      497
Val Val Lys Val Thr Phe Asn Lys Gln Asp Ser Leu Val Ile Leu Thr
      120             125             130             135

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231/233

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 Ile Met Ala Thr Leu Lys Ile Arg Asn Ser Asn Phe Tyr Thr Val Ala  
 140 145 150  
 gtg acc agc ctg tcc agc cag att cag tac atg aac aca gtg gtc agt 593  
 Val Thr Ser Leu Ser Ser Gln Ile Gln Tyr Met Asn Thr Val Val Ser  
 155 160 165  
 aca tat gtg act act aac gtc tcc ctt att cca cct cgg agt gag caa 641  
 Thr Tyr Val Thr Thr Asn Val Ser Leu Ile Pro Pro Arg Ser Glu Gln  
 170 175 180  
 ctg gtg aat ttt acc ggg aag gcc gag atg gga gga ccg ttt tcc tat 689  
 Leu Val Asn Phe Thr Gly Lys Ala Glu Met Gly Gly Pro Phe Ser Tyr  
 185 190 195  
 gtg tac ttc ttc tgc acg gta cct gag atc ctg gtg cac aac ata gtg 737  
 Val Tyr Phe Phe Cys Thr Val Pro Glu Ile Leu Val His Asn Ile Val  
 200 205 210 215  
 atc ttc atg cga act tca gtg aag att tca tac att ggc ctc atg acc 785  
 Ile Phe Met Arg Thr Ser Val Lys Ile Ser Tyr Ile Gly Leu Met Thr  
 220 225 230  
 cag agc tcc ttg gag aca cat cac tat gtg gat tgt gga gga aat tcc 833  
 Gln Ser Ser Leu Glu Thr His His Tyr Val Asp Cys Gly Gly Asn Ser  
 235 240 245  
 aca gct att taacaactgc tattggttct tccacacagc gcctgtagaa gagagcac 890  
 Thr Ala Ile  
 250  
 agcatatgtt cccaaggcct gagttctgga cctaccccca cgtggtgtaa gcagaggagg 950  
 aattggttca cttaactccc agcaaacatc ctctgtccac ttaggaggaa acacctccct 1010  
 atggtaccat ttatgtttct cagaaccagc agaatcagtg cctagcctgt gccagcaaa 1070  
 tagttggcac tcaataaaga tttgcagaat ttaatacaga tcttttcagc tgttcttagg 1130  
 gcattataaa tggaaatcat aacgtggttc taggttatca aaccatggag tgatgtggag 1190  
 ctaggattgt gagtgacctg cagggcatta tcagtgcctc atctgtgcag aagtcgcagc 1250  
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 cagctgttcc caaaggcctg ggagcttttt gaaaagaaag aaaaaagtgt gttggctttt 1370  
 ttttttttta gaaagttaga attgttttta ccaagagtot atgtggggct tgattcaccc 1430  
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 ttc 1493

232/233

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 <222> (26)...(550)  
 <400> 150

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                                Met Gln Ala Pro Ala Phe Arg Asp Lys
                                1             5

aaa cag ggg gtc tca gcc aag aat caa ggt gcc cat gac cca gac tat      100
Lys Gln Gly Val Ser Ala Lys Asn Gln Gly Ala His Asp Pro Asp Tyr
  10             15             20             25

gag aat atc acc ttg gcc ttc aaa aat cag gac cat gca aag ggt ggt      148
Glu Asn Ile Thr Leu Ala Phe Lys Asn Gln Asp His Ala Lys Gly Gly
          30             35             40

cat tca cga ccc acg agc caa gtc cca gcc cag tgc agg ccg ccc tca      196
His Ser Arg Pro Thr Ser Gln Val Pro Ala Gln Cys Arg Pro Pro Ser
          45             50             55

gac tcc acc cag gtc ccc tgc tgg ttg tac aga gcc atc ctg agc ctg      244
Asp Ser Thr Gln Val Pro Cys Trp Leu Tyr Arg Ala Ile Leu Ser Leu
          60             65             70

tac atc ctc ctg gcc ctg gcc ttt gtc ctc tgc atc atc ctg tca gcc      292
Tyr Ile Leu Leu Ala Leu Ala Phe Val Leu Cys Ile Ile Leu Ser Ala
          75             80             85

ttc atc atg gtg aag aat gct gag atg tcc aag gag ctg ctg ggc ttt      340
Phe Ile Met Val Lys Asn Ala Glu Met Ser Lys Glu Leu Leu Gly Phe
          90             95             100             105

aaa agg gag ctt tgg aat gtc tca aac tcc gta caa gca tgc gaa gag      388
Lys Arg Glu Leu Trp Asn Val Ser Asn Ser Val Gln Ala Cys Glu Glu
          110             115             120

aga cag aag aga ggc tgg gat tcc gtt cag cag agc atc acc atg gtc      436
Arg Gln Lys Arg Gly Trp Asp Ser Val Gln Gln Ser Ile Thr Met Val

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125	130	135	
agg agc aag att gat aga tta gag acg aca tta gca ggc ata aaa aac			484
Arg Ser Lys Ile Asp Arg Leu Glu Thr Thr Leu Ala Gly Ile Lys Asn			
140	145	150	
att gac aca aag gta cag aaa atc ttg gag gtg ctg cag aaa atg cca			532
Ile Asp Thr Lys Val Gln Lys Ile Leu Glu Val Leu Gln Lys Met Pro			
155	160	165	
cag tcc tca cct caa taaatgagag gacattgtgg cagccaaagc cac			580
Gln Ser Ser Pro Gln			
170			
aacttggaag atggggctgc acctgccaac gaagacggga aatgaccccc cccccagcc			640
tagtgtgaac ctgccccctcg tcccacgtat agaaaaacct cgagtcattg tgaatgagtg			700
tctcgaggatt gctcgtgtgt gtgtacacct gcgtgcgtgt gtgtgcgtgt gtgcgcgtgt			760
gttcgtgtat gtgcgtgtgt gcgtgcgcgt gtgtgtgcat tttgcaaagg gtggacattt			820
cagtgtatct cccagaaagg tgatgaatga ataggactga gagtcacagt gaatgtggca			880
tgcattgcctg tgcattgtga catatgtgag tctcggcattg tcacgggtggg tggtgtgtc			940
tgagcacctc cagcagatgt cactctgagt gtgggtgttg gtgacatgca ttgcacgggc			1000
ctgtctccct gtttgtgtaa acatactaga gtatactgcg gcgtgttttc tgtctaccca			1060
tgtcatgggtg ggggagattt atctccgtac atgtgggtgt cgccatgtgt gccctgtcac			1120
tatctgtggc tgggtgaacg gctgtgtcat tatgagtgtg ccgagttatg ccaccctgtg			1180
tgctcagggc acatgcacac agacatttat ctctgcactc acattttgtg acttatgaag			1240
ataaataaag tcaagggaaa acag			1264